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ABSTRACT

Minnesota state policy makers are concerned about teacher compensation because it constitutes a major category of state and local spending and can affect education results. This report examines compensation issues by describing the pay structure of Minnesota's K-12 public school teachers, making pay comparisons with other professionals, and examining teacher supply and demand. During the 1988-89 school year, the average compensation for Minnesota teachers was $38,400, including $31,233 in salary and $7,167 in fringe benefits. Pay comparisons indicate that teacher pay is competitive with pay in most other professional and managerial occupations. Various measures of teacher supply and demand indicate that teaching is competitive with most other occupations. However, only one-fourth of teacher graduates from Minnesota colleges find full-time teaching jobs in Minnesota. The state's schools receive an average of 44 applications per job openings. School administrators surveyed reported little difficulty in finding well-qualified applicants for most types of teacher positions. Only 17 percent of districts with science openings reported a recruitment problem. Teaching positions in specialized fields (special education, counseling, and foreign language) experienced the most recruiting difficulty. Targeted pay increases for these specialty areas might be an effective strategy. (MLH)

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Teacher Compensation

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Teacher Compensation

January 1991

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JAMES R. NOBLES, LEGISLATIVE AUDITOR

January 28, 1991

Members
Legislative Audit Commission

Dear Commission Members:

In May 1990, the Legislative Audit Commission directed the Program Evaluation Division to examine teacher compensation in Minnesota's public schools. This report describes trends in teacher salaries and fringe benefits, compares teacher compensation with that of other professionals, and examines teacher supply and demand in Minnesota's public schools.

The report concludes that teacher pay is competitive with most other professional and managerial occupations. After adjusting for number of days worked and hours worked beyond the normal work day, the hourly pay for teachers is higher, on average, than that of other college graduates and employees in other professional or managerial occupations. Teacher pay is also higher, on average, than that of state professional, supervisory, and managerial employees in Minnesota.

The report also shows that there is a large surplus of teachers in Minnesota. Few districts had difficulty recruiting well-qualified teachers for most teacher positions.

We appreciate the assistance we received from numerous sources, including the Department of Education, the Department of Employee Relations, the Department of Jobs and Training, the Minnesota School Boards Association, teacher associations, and the House Research Department. We also thank the school district officials who responded to our survey.

This report was researched and written by Daniel Jacobson (project manager), with assistance from Bruce Williams. Elliot Long served as a consultant to the study.

Sincerely yours,

James R. Nobles
Legislative Auditor

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TEACHER COMPENSATION

Executive Summary

State policy makers are concerned about teacher compensation for several reasons. First, teacher compensation is a major category of state and local spending. Compensation for Minnesota's public elementary and secondary school teachers totalled approximately $1.8 billion during the 1988-89 school year, much of which was financed by the state. Second, teacher pay can affect education results. If teacher pay is too low, schools may not be able to attract and retain high quality staff. If teacher pay is too high, schools may lack resources to hire enough teachers to meet their educational needs. Advocates of higher teacher pay argue that teacher salaries are not competitive with salaries of other professions. Others contend that teachers are well paid compared with other professions, particularly when measured on an hourly basis.

Our report examines these issues by describing the pay structure of Minnesota's K-12 public school teachers, making pay comparisons with other professionals, and examining teacher supply and demand. Our research questions were:

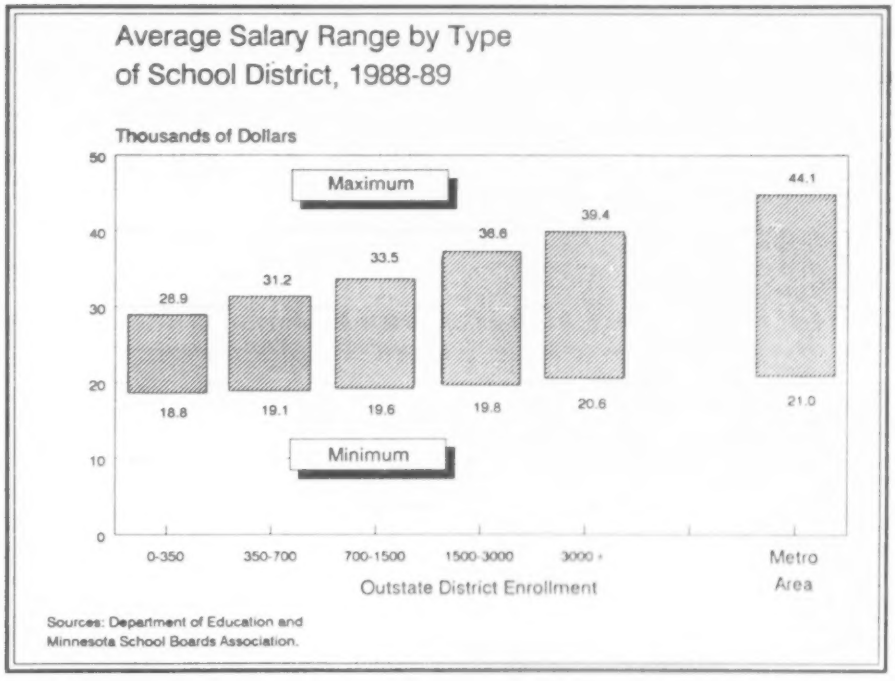
- **How have teacher salaries and fringe benefits changed during the past thirty years?**
- **According to national studies, what are the relationships among teacher salaries, teacher supply, and student learning?**
- **How does teacher compensation, including salaries and fringe benefits, compare with compensation of other occupations and other college graduates? How many days per year do teachers and other professionals work? How many hours per day?**
- **Is teacher pay sufficient to attract well-qualified staff? How does this vary by region, size of district, and subject area?**

COMPENSATION FOR MINNESOTA PUBLIC SCHOOL TEACHERS

During the 1988-89 school year, the average compensation for Minnesota's public school teachers was $38,400, including $31,233 in salary and $7,167 in fringe benefits. The salary figure is based on the regular school year and excludes pay for extra duties. The fringe benefit figure includes the average employer contribution of $4,954 for retirement benefits (including social security) and $2,213 for insurance benefits (health, dental, life, and disability insurance).

In each school district, teacher salaries are determined by teaching experience and amount of training. In 1988-89, the average school district in Minnesota had a beginning salary of $20,338 and a maximum salary of $39,173. In the Twin Cities metropolitan area, the average school district had a salary range of $21,007 to $44,052. The average outstate school district with fewer than 350 students had a salary range of $18,784 to $28,946.

Maximum teacher salaries rise rapidly as district size increases.



COMPENSATION TRENDS, 1961-1989

We examined trends in teacher salaries, after adjusting for inflation, between 1960-61 and 1988-89.

- **In constant dollars, teacher salaries grew from $19,942 in 1961 to $28,298 in 1972, declined to $24,667 in 1980, and went back up to $31,241 in 1988.**

According to a report by the Research Department of the Minnesota House of Representatives, most of the real growth in teacher salaries between 1974-75 and 1988-89 was due to gains in teacher experience and training. However, it is doubtful that teacher experience and training explain most of the salary growth during an earlier time period (1960-61 to 1974-75).

Our analysis of fringe benefit trends indicates that fringe benefits for teachers have grown much faster than teacher salaries.

- **In constant dollars, fringe benefits grew by 168 percent between 1968-69 and 1988-89, whereas salaries grew by 22 percent.**

Total compensation, after adjusting for inflation, grew by 32 percent during this period.

If salaries of other workers increase substantially faster or slower than inflation, then inflation may not be the most appropriate way to assess the trends in teacher salaries. As a result, we compared growth in teacher salaries with growth in earnings of all workers in the United States. Teacher salaries in relation to salaries in general were higher during the late 1980s than any previous time during the past thirty years. The ratio of teacher salaries to annual average earnings of U.S. workers (full-time equivalent) grew from 1.08 in 1961 to 1.23 in 1971, fell to 1.05 in 1980, and climbed to 1.25 in 1989.

STUDIES OF TEACHER PAY, TEACHER SUPPLY, AND STUDENT ACHIEVEMENT

Nationally, numerous studies have examined the relationships among teacher pay, teacher supply, and student achievement. Empirical studies of teacher supply have found that raising teacher pay attracts more people to teaching and reduces teacher turnover. One study found that salary increases reduced turnover rates for low-ability teachers more than for high-ability teachers.

National studies do not establish that higher teacher pay improves student achievement.

National studies do not establish that higher teacher pay improves student achievement. Higher teacher pay is caused by gains in teacher training and experience as well as higher salary schedules. National studies indicate that teacher education beyond a bachelor's degree has little relationship with student achievement. Only eight out of 113 studies that examined teacher education and student outcomes found a positive effect that was statistically significant.

There is evidence that experienced teachers tend to be more effective than inexperienced teachers, though most of the advantage due to experience occurs in the first two years of teaching.

Out of 69 studies that examined the relationship between teacher pay and student outcomes, only eleven found a positive effect that was statistically significant. However, it is difficult to interpret these results because it is hard to disentangle the effects of teacher pay from other factors such as teacher experience, education, and class size. But if teacher pay were a major tool for

improving student achievement, one would expect to see stronger evidence than currently exists.

PAY COMPARISONS

To find out whether public school teaching in Minnesota is competitive with alternative occupations, we made a variety of pay comparisons and examined teacher supply and demand. Our pay comparisons focused on jobs commonly held by college graduates because schools must compete with these jobs to attract people to teaching.

We report pay comparisons on an hourly as well as an annual basis. Annual comparisons are not fair because they ignore the value of a long summer vacation for teachers.

Hourly pay comparisons have been criticized because they do not recognize the extra hours worked outside the normal work day. To adjust for hours worked outside the normal work day, we used national surveys that asked teachers and other professionals how many hours they worked per week. A survey by the National Education Association found that teachers worked 46.5 hours per week, excluding time spent on extra-curricular activities after regular school hours. The Current Population Survey conducted by the U.S. Bureau of Labor Statistics found that full-time employees in professional and managerial occupations worked an average of 44 hours per week on their primary job.

Hourly pay comparisons are also criticized because teachers normally could not earn as high a wage on summer jobs as they could on year-around jobs. However, a national survey indicates that most teachers prefer not to work during the summer rather than having a longer work year with higher pay. For people who prefer a long summer vacation, the hourly pay comparison is the most appropriate. For people who prefer to work year-around, earnings potential seems to be the appropriate basis for comparison. On average, teachers' earning potential would be between the annual and hourly pay rates.

Median hourly wages for teachers exceeded that for other college graduates by nine percent.

We compared the median salary and average fringe benefits during 1988-89 for Minnesota public school teachers with that for other employees in the nation. We used national surveys by the U.S. Bureau of Labor Statistics to obtain median salaries and average fringe benefits for other employees. After adjusting for vacations, holidays, and hours worked per day, we found that:

- **Minnesota teachers, on average, had higher fringe benefits and higher hourly wages than college graduates and employees in professional and managerial occupations.**

The median hourly wage for Minnesota teachers exceeded the median hourly wage for professional and managerial occupations by 15 percent. It exceeded the median hourly wage for college graduates (25 years and older) by 9 percent.

Salary Comparisons, 1988-89

	Number of Employees (In 000's)	Median Salary of Full-Time Employees	
		Hourly	Annual
Minnesota Teachers[1]	39.4	$18.18	$30,769
U.S. College Graduates, 25 years and over (excludes teachers)	17,498	16.74	34,617
Minnesota State Employees (Professionals, Supervisors, and Managers)[2]	9.4	16.59	33,904
Employees in Professional or Managerial Occupations (includes private and public sector employees in the U.S., excludes teachers)	19,788	15.76	32,590

Sources: Minnesota House Research Department, U.S. Bureau of Labor Statistics (Current Population Survey), Minnesota Department of Employee Relations.

[1]Salary is base salary for regular school year. It excludes pay for extra duties.
[2]Figures are mean salaries as of January, 1989.

On an annual basis, the median salary for Minnesota teachers was $1,821 less than that for employees in professional and managerial occupations and about $3,848 less than the median salary for college graduates.

Annual fringe benefit costs are higher for teachers than for private sector employees.

The average fringe benefit cost for Minnesota teachers is higher than the average for professional, technical, and managerial employees in the private sector, regardless of whether costs are measured on an hourly or annual basis. In 1988-89, fringe benefits (health, dental, life, and disability insurance benefits and retirement benefits, excluding social security) cost $5,018 per year for teachers, compared with $3,418 for professional and technical employees and $3,734 for managerial employees.

Although teacher pay compares favorably with the pay of the average college graduate, several occupations offer better pay than teaching. Occupations with higher pay than teaching tend to be in technical fields (such as engineering and system analysis) or require more extensive training (such as law and medicine). According to salary surveys by the Department of Jobs and Training, 7 out of 27 professional occupations surveyed had higher median hourly wages than public school teachers. Sixteen of these 27 occupations had higher annual salaries.

We compared salaries and fringe benefits for teachers with those for Minnesota state employees. We found that in 1988-89:

- **On an hourly basis, the average total compensation for teachers was 15 percent higher than the average for professional, supervisory, and managerial state employees.**

On an annual basis, total compensation for teachers was $1,820 less than the average for the same three classes of state employees. Teachers have higher annual fringe benefit costs than state employees because of higher retirement costs.

Comparisons with specific job classes in Minnesota state government follows a pattern similar to what we found for non-state employees in Minnesota. Common job classes with higher hourly wages than teachers were system analysts, engineers, and attorneys.

SUPPLY AND DEMAND FOR TEACHERS

During 1988-89, Minnesota's public schools hired 4,316 new licensed staff, an amount equal to 8.5 percent of the previous year's total licensed staff. If people who transferred between districts in Minnesota are excluded, new hires make up only 5.7 percent of existing staff. New hires include overall growth in staff between 1987-88 and 1988-89 (1.8 percent) and staff turnover (3.9 percent).

Student enrollment and teacher retirements will increase demand for teachers, but not at a fast rate.

Two factors that can cause large changes in demand for teachers are student enrollment and teacher retirement rates. However, demographic projections indicate that neither factor will cause large changes in teacher demand in the near future. Population projections by the State Demographer indicate that the number of school-age children will increase by five percent by 1995, remain the same during the following five years, and decline after 2000. The age distribution of teachers indicates that the number of teachers reaching retirement age will increase but will not reach its peak for 20 to 25 years.

Teachers are hired from three major sources: (1) a reserve pool of former teachers that hold valid licenses to teach in Minnesota, (2) teachers from other states, and (3) recent graduates of Minnesota colleges. Various measures of teacher supply and demand indicate that:

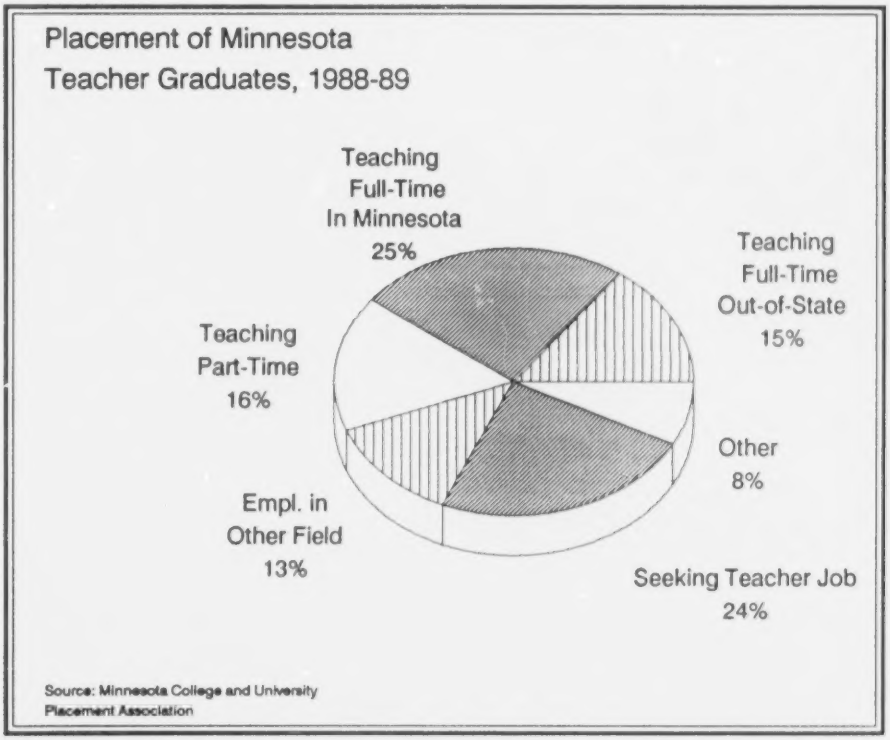
- **Currently, there is a large surplus of teachers in Minnesota.**

Placement data from Minnesota's colleges show that only one-fourth of "teacher" graduates during 1988-89 found full-time teaching jobs in Minnesota. Another 15 percent obtained full-time teaching positions in other states, and 16 percent found part-time positions (in-state or out-of-state). The number of graduates prepared to teach has increased from 2,582 in 1984-85 to 3,550 in 1988-89. This number alone exceeds the number of new hires (excluding transfers) by over 600.

In addition, over 2,000 people from other states applied for teaching licenses in Minnesota. About one-third of these people obtained teaching jobs in Minnesota (including part-time positions).

Approximately 38,000 people who do not work in Minnesota's schools hold licenses to teach in Minnesota. In 1988-89, Minnesota's public schools hired about 800 teachers from this reserve pool, an amount equal to 28 percent of the new teachers hired.

One-fourth of Minnesota "teacher" graduates found full-time teaching positions in Minnesota.


Placement of Minnesota
Teacher Graduates, 1988-89
Teaching Full-Time In Minnesota 25%
Teaching Full-Time Out-of-State 15%
Teaching Part-Time 16%
Other 8%
Empl. in Other Field 13%
Seeking Teacher Job 24%
Source: Minnesota College and University Placement Association

The supply and demand for teachers varies by subject area. Our survey of Minnesota's school districts indicates that the number of applications per job opening during 1990 ranged from 73 for elementary positions to 8 for special education for the emotionally and behaviorally disturbed (EBD). Subjects with relatively few applications per opening (14 or fewer) were in specialized fields, including special education, foreign language, and support staff positions.

Few districts had difficulty recruiting well-qualified teachers for elementary, social studies, physical education, English, art, or mathematics.

Small districts (700 students or fewer) tended to receive fewer applications per opening for specialized positions than large districts. For example, small districts received an average of less than five applications per opening for EBD and support staff positions, compared with 12 and 15 for districts in the Twin Cities area. Application rates for elementary, social studies, and physical education were high for all size categories.

Teacher recruitment problems reported by school administrators in our survey also tended to be in specialized fields. Forty-three percent of districts with job openings for special education for the emotionally and behaviorally disturbed said they had difficulty recruiting well-qualified staff. Other positions with relatively high recruitment problem rates were counselor/psychologist (27 percent), special education other than EBD (26 percent), foreign language (23 percent), and science (17 percent). No district reported any difficulty recruiting well-qualified staff for elementary, social studies, or physical education positions. Few districts reported problems in English (1 percent), art (5 percent), or mathematics (5 percent).

Our survey indicates that 51 percent of school administrators are very satisfied with the quality of teacher applicants and 44 percent are satisfied. Our survey

Teacher Recruiting Problems by Subject Area, 1990

Subject Area	Number of Districts with Job Opening	Percent who had Difficulty Recruiting Well-Qualified Staff
Special Education for the Emotionally or Behaviorally Disturbed (EBD)	54	43%
Counselor/Psychologist	67	27
Special Education (non-EBD)	131	26
Foreign Languages	69	23
Science	87	17
Teaching Combinations	33	15
Miscellaneous Other	104	15
Home Economics/Industrial Arts	49	10
Media/Library Specialist	34	9
Music	98	9
Mathematics	76	5
Art	43	5
English	104	1
Elementary Education	215	0
Social Studies	65	0
Physical Education	53	0

Source: Office of Legislative Auditor's survey of Minnesota school districts.

also indicates that 56 percent of school administrators surveyed think that "teacher pay is currently high enough to attract a sufficient number of well-qualified teachers." Twenty-five percent said it was not high enough, and nineteen percent gave a qualified opinion such as teacher pay was high enough for some fields but not for others. In southwestern Minnesota, 43 percent of administrators think that salaries are high enough, compared with 53 to 64 percent in the other regions.

INTRODUCTION

During the 1980s, many school reform advocates promoted higher teacher pay as one way to improve education. Citing the decline in real teacher salaries during the 1970s, they argued that teacher salaries were not competitive with salaries of other professions. For example, in 1983 the National Commission on Excellence in Education argued that teacher salaries were too low to attract enough talented people to teaching. The national education literature frequently discussed how low teacher pay would lead to teacher shortages, particularly for science and mathematics teachers.

Others contended that teachers are well paid compared to other professionals, particularly when measured on an hourly basis. They argued that education dollars could be better spent in other ways, such as reducing class size.

Our report examines these issues by describing the pay structure of Minnesota's K-12 public school teachers, making pay comparisons with other professionals, and examining teacher supply and demand. Our research questions were:

- **How have teacher salaries and fringe benefits changed during the past thirty years?**
- **According to national studies, what are the relationships among teacher salaries, teacher supply, and student learning?**
- **How does teacher compensation, including salaries and fringe benefits, compare with compensation of other occupations and other college graduates? How many days per year do teachers and other professionals work? How many hours per day?**
- **Is teacher pay sufficient to attract well-qualified staff? How does this vary by region, size of district, and subject area?**

To answer these questions, we used a variety of data sources, including teacher compensation data from the Minnesota School Board Association, the Research Department of the Minnesota House of Representatives, the Department of Education, and the National Education Association. To make pay comparisons with other occupations, we used national data from the U.S. Bureau of Labor Statistics, state data from the Minnesota Department of Jobs and Training, data on state employees from the Minnesota Department

of Employee Relations, and miscellaneous other sources. To examine teacher supply and demand, we used teacher licensing data from the Minnesota Department of Education, reviewed teacher placement data from Minnesota's colleges, and conducted a survey of Minnesota's school districts.

In the first chapter, we describe teacher compensation in Minnesota, how it varies by training level and experience, and how it varies across the state. We examine trends in teacher salaries and fringe benefits over the past thirty years and how Minnesota teacher salaries compare with salaries in other states. Finally, we discuss the literature about the relationships among teacher pay, teacher supply, and student achievement.

In the second and third chapters, we focus on whether teacher pay is competitive with other occupations. Teachers and other professionals consider pay and a variety of other factors when choosing a career. In the second chapter, we compare teacher pay with that of a broad range of other occupations.

The non-monetary factors which affect how well teaching competes with other professions are subjective and vary greatly from person to person. As a result, we did not attempt to measure the overall attractiveness of each job. Instead, we examined the supply and demand for teachers. The results of this analysis are presented in Chapter 3.

TEACHER COMPENSATION

Chapter 1

In Minnesota, policy makers are concerned about teacher pay because of its relationship to education quality and its effect on state and local taxes. Compensation for Minnesota's public elementary and secondary school teachers totalled about $1.8 billion during the 1988-89 school year, about 55 percent of the schools' total operating expenditures. In this chapter, we address the following questions:

- **What is the state's interest in teacher pay?**
- **How much are teachers in Minnesota paid, including fringe benefits as well as salaries? How does teacher pay vary among Minnesota school districts?**
- **How has teacher pay changed over the past thirty years? How does teacher pay in Minnesota compare with other states?**
- **What does the research literature say about the relationships among teacher pay, teacher supply, and student achievement?**

TEACHER COMPENSATION AS A STATE POLICY ISSUE

Teacher pay levels are normally set through collective bargaining between individual school districts and teacher unions. Nevertheless, teacher pay is a state concern for several reasons. One reason is that teacher pay is a major category of state and local spending. Nearly one-third of the state's budget is spent on public elementary and secondary education, half of which is used for teacher salaries.[1]

Second, the state has an interest in education results. If salaries are too low, there may be a shortage of well-qualified teachers. If salaries are too high, schools may lack resources to hire enough teachers to meet their educational needs.

1 In 1987, 32 percent of the state's budget was allocated to appropriations and property tax credits for public elementary and secondary education.

State policy affects teacher pay or the supply and demand for teachers in several ways. The amount of state aid provided to schools affects the fiscal context in which schools or teachers bargain for compensation and working conditions. Under current state law, teachers have the right to strike. If they strike, they can still receive a full-year's salary because days missed at the beginning of the school year may be added at the end of the school year. This may enable teachers to bargain for higher salaries than they would otherwise obtain. Critics of the right to strike argue that higher compensation comes at the expense of other educational spending needs. Advocates of higher salaries counter that higher salaries are worthwhile because they attract better teachers.

Teacher pay is not the only way that the state influences the supply of teachers. The state regulates who can teach in Minnesota by licensing teachers. One source of potential teachers is college graduates who did not prepare for teaching while in college but would like to teach. The state affects how many teachers come from this pool by setting the requirements that these graduates must meet before they can teach.

TEACHER PAY IN MINNESOTA

This section describes teacher salary levels and fringe benefit costs. It describes how teacher experience and training affect teacher salaries and how salaries and fringe benefits vary among Minnesota school districts.

Total Compensation

Table 1.1 summarizes average teacher compensation in Minnesota for the 1988-89 school year. The table is based on Minnesota School Boards Association (MSBA) data from 382 school districts which employ about 96 percent of the state's public school teachers. The data include employees covered by district teacher salary schedules, including counselors and librarians as well as teachers. Superintendents, principals, and other administrators are excluded. Salary data include only the base salary for the school year. Compensation for extra duties is not included.

Fringe benefit data include the employer cost of the following fringe benefits: retirement benefits (including social security), and health, dental, long-term disability, and life insurance benefits. Workers' compensation, unemployment insurance, severance pay, and miscellaneous smaller benefits are not included.

As Table 1.1 and Figure 1.1 show:

- **Average teacher compensation for the 1988-89 school year was $38,400, including $31,233 in salary and $7,167 in fringe benefits.**

- **Minnesota school districts spent $4,954 per teacher on retirement programs, an amount equal to 69 percent of the fringe benefit cost.**

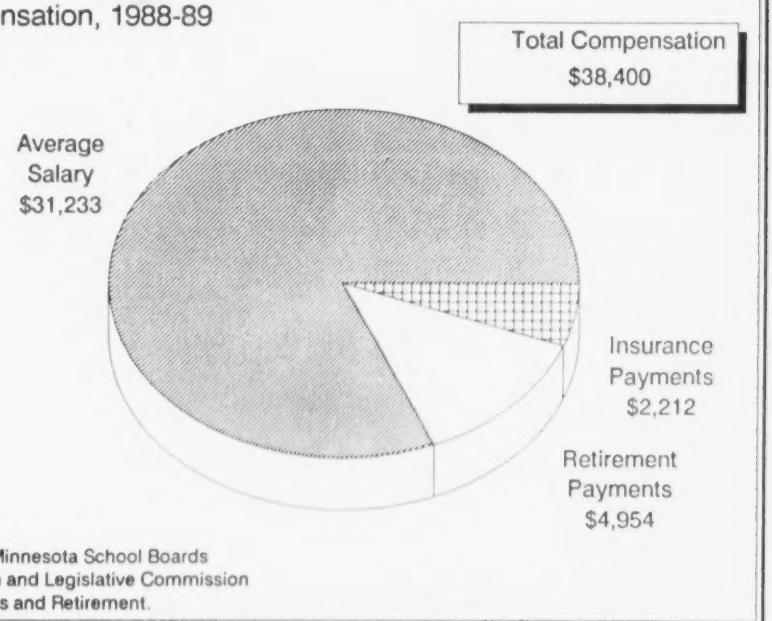
Table 1.1: Average Teacher Compensation, 1988-89

Salary[1]	$31,233
Fringe Benefits[2]	7,167
Retirement (including Social Security)	4,954
Health Insurance	1,845
Dental Insurance	174
Disability Insurance	118
Life Insurance	76
Total Compensation[3]	$38,400

Source: Minnesota School Boards Association and Legislative Commission on Pensions and Retirement.

[1]Salary is base salary for the regular school year. It excludes pay for extra duties.
[2]Employer cost only.
[3]Excludes workers' compensation, unemployment compensation, severance pay, and other miscellaneous benefits.

Figure 1.1: Average Teacher Compensation, 1988-89



Sources: Minnesota School Boards Association and Legislative Commission on Pensions and Retirement.

The average salary of $31,233 does not include pay for extra duties.

Salary averages based on MSBA data are close to other salary estimates. According to the Minnesota House Research Department, the average base salary for the 1988-89 school year was $31,223 for teachers and $31,421 for teachers and support personnel combined.[2] These estimates were based on the Minnesota Department of Education's teacher licensing data base. They excluded teachers who had miscoded salaries or who were part-time, tem-

2 Research Department of the Minnesota House of Representatives, *Teacher Salary Trends in Minnesota: 1974-1988* (St. Paul, 1991).

porary, post-secondary, or inactive. The National Education Association, using the same data base, estimated that the average salary was $30,660.

The fringe benefit costs shown include employer costs only. They exclude teacher contributions for social security, retirement, and insurance benefits. All school districts in Minnesota provide retirement and health insurance benefits. Minneapolis, St. Paul, and Duluth each has its own retirement plan. Teachers in all other school districts are covered by the retirement plan administered by the Teacher's Retirement Association. In 1988-89, 67 percent of school districts provided life insurance, 66 percent gave long-term disability insurance, and 35 percent provided dental insurance.

Teachers may receive additional pay beyond the salary data summarized above if they perform extra duties at school or work outside the school system. We have average pay data only for extra-curricular activities of Minnesota teachers. Extra-curricular activities include coaching athletic teams, debate, and cheerleaders; directing plays; and helping produce school annual publications. In 1988-89, teachers received an average of $922 in additional pay for extra-curricular activities (this average includes teachers who did not participate in extra-curricular activities). Some examples of average pay rates are $3,248 for hockey coaches, $2,649 for football coaches, and $2,334 for volleyball coaches.

Other school activities for which teachers are paid include extra academic service (department chair, summer school teaching), chaperoning buses and parties, taking tickets, and driver education. We do not have summary cost data for these activities.

Data on outside employment are not available for Minnesota teachers. A national study conducted by the National Education Association in 1985-86 found that 13.8 percent of teachers held school-related jobs during the summer, 19.5 percent worked outside the school system during the summer, and 13.7 percent had second jobs during the school year. Teachers who worked outside the school system during the summer (whether full or part time) earned an average of $3,183 (in 1989 dollars). Those working within the school system during the summer earned an average of $1,487 (in 1989 dollars).

Salary Structure

Teacher salaries are based on amount of training and experience.

Each school district negotiates salary and fringe benefits with teachers every two years. In each district, salary is determined by teaching experience and amount of training. Table 1.2 and Figures 1.2 and 1.3 show how teacher base salary varies with experience and training for the average school district.[3] The table only shows selected portions of a typical salary schedule. Most teacher salary schedules contain annual increments for experience (particularly during the first twelve years) and 15 credit increments for education.

In 1988-89, average salary ranges were from $20,338 to $29,388 for teachers with a bachelor's degree and from $22,835 to $35,789 for teachers with a master's degree. The number of years of service required to reach the maxi-

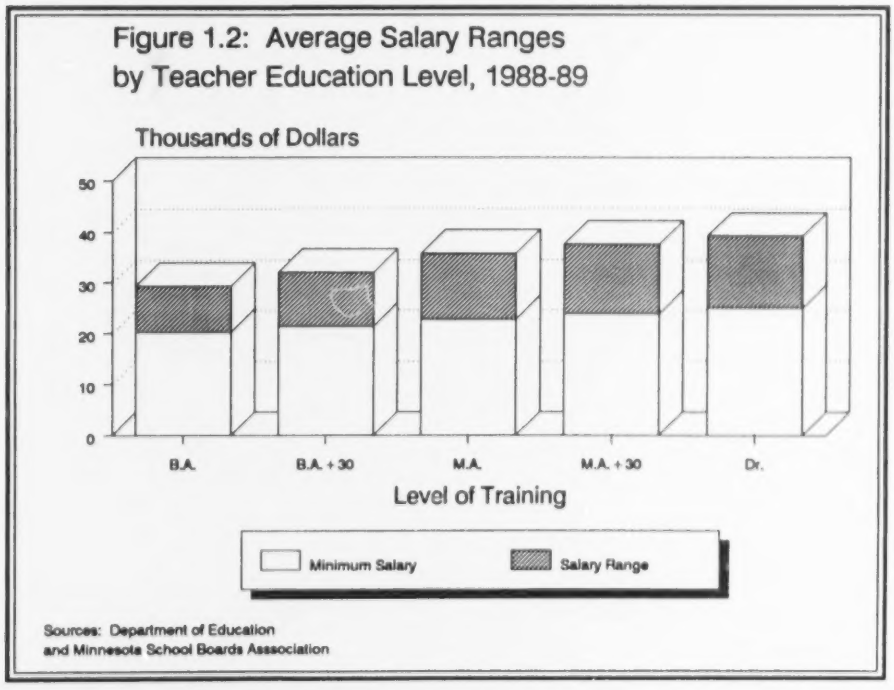
3 Salary schedules do not necessarily give full credit for teaching experience gained in other districts.

Table 1.2: Average Teacher Salary Schedule in Minnesota, 1988-89

Years of Experience	Training Level				
	BA+0	BA+30 Credits	MA+0	MA+30 Credits	Doctorate
0	$20,338	$21,403	$22,835	$23,920	$24,970
4	22,889	24,227	26,079	27,318	28,486
8	25,706	27,538	29,927	31,295	32,544
12	28,055	30,344	33,722	35,357	36,909
16	28,907	31,435	35,200	36,917	38,549
20	29,226	31,795	35,610	37,336	38,985
Maximum	29,388	31,957	35,789	37,521	39,173

Source: Department of Education and Minnesota School Boards Association.

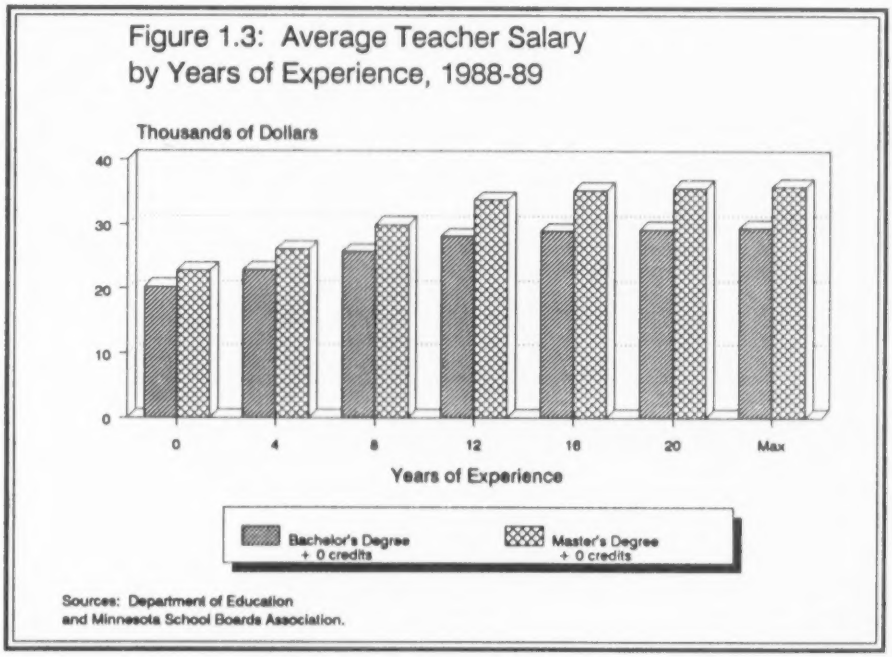
The average maximum salary ranges from $29,388 for teachers with a bachelor's degree to $39,173 for teachers with a doctor's degree.



mum salary varies widely among districts. In most districts, teachers reach the maximum salary after 12 to 20 years of service.

Almost all school districts pay higher salaries for additional education through a master's degree. However, many small districts do not give salary increases beyond a master's degree, while large districts often pay additional salary in 15 credit increments beyond a master's degree (up to a limit of 45 or 60 credits). Large districts often give another increase if a teacher earns a doctor's degree.

In an average school district during 1988-89, teachers with a master's degree earned from $2,500 to $6,400 more than teachers with a bachelor's degree.



Teachers with a master's degree earned an additional $1,085 to $1,732 by completing 30 additional credits. In both comparisons, the lower figure is for beginning teachers and the higher figure is for experienced teachers at the top of their range.

Variation in Teacher Salaries and Fringe Benefits

Teacher salaries and fringe benefits vary by region and size of district. Figures 1.4 and 1.5 (and Tables 1.3 and 1.4) show that:

Table 1.3: Teacher Compensation by Region, 1988-89

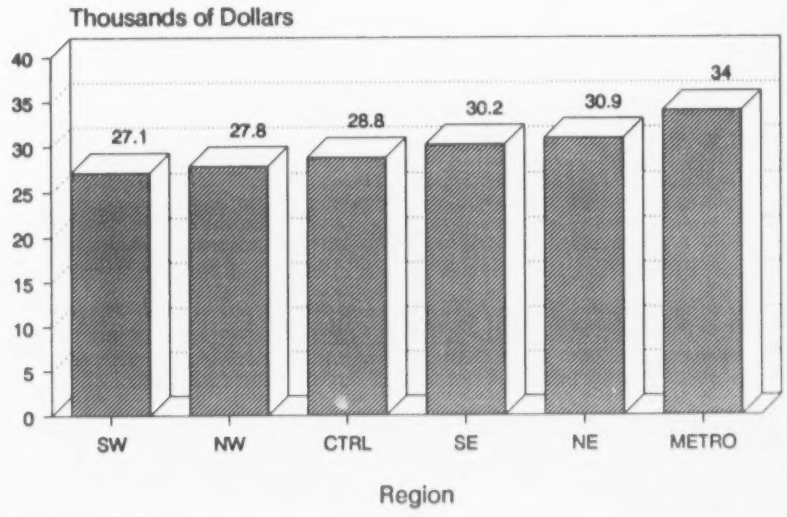
	Southwest	Northwest	Central	Southeast	Northeast	Twin Cities Metropolitan Area
Salary[1]	$27,069	$27,782	$28,775	$30,172	$30,931	$34,022
Fringe Benefits[2]	6,021	6,429	6,579	6,699	7,005	7,664
Retirement Benefits (including Social Security)	4,110	4,473	4,495	4,721	4,577	5,269
Health Insurance	1,714	1,771	1,750	1,730	2,002	1,917
Dental Insurance	71	67	163	87	161	247
Disability Insurance	91	72	104	101	191	132
Life Insurance	35	46	67	60	74	99
Total Compensation[3]	33,090	34,211	35,354	36,871	37,936	41,686

Source: Minnesota School Boards Association.

[1]Salary is base salary for regular school year. It excludes pay for extra duties.
[2]Employer cost only.
[3]Excludes workers' compensation, unemployment compensation, severance pay, and other miscellaneous benefits.

Average teacher salaries are highest in the Twin Cities metropolitan area and are lowest in western Minnesota.

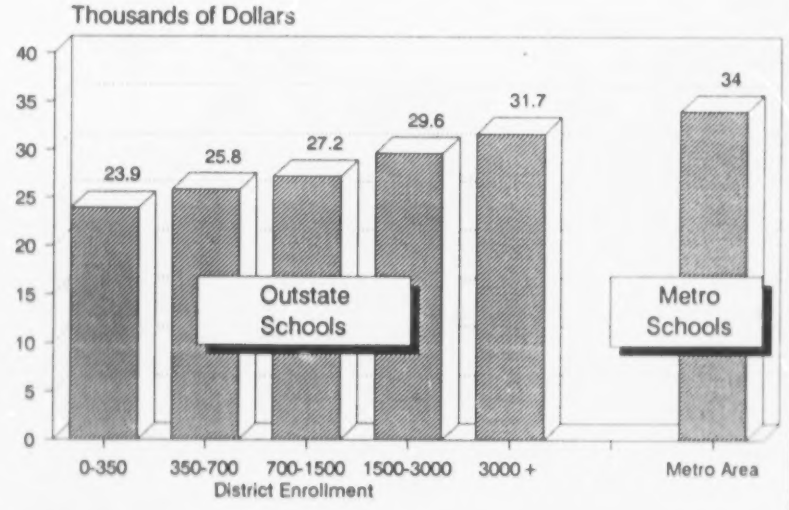
Figure 1.4: Average Teacher Salary by Region, 1988-89



Sources: Minnesota School Boards Association and Department of Education

Both teacher salaries and fringe benefits increase with district size.

Figure 1.5: Average Teacher Salary by Type of District, 1988-89



Sources: Minnesota School Boards Association and Department of Education

Table 1.4: Teacher Compensation by Type of District, 1988-89

	Outstate Minnesota (by student enrollment)					Twin Cities Metropolitan Area
	0-350	350-700	700-1500	1500-3000	Over 3000	
Salary[1]	$23,887	$25,808	$27,176	$29,559	$31,676	$34,022
Fringe Benefits[2]	5,263	5,793	5,940	6,929	7,275	7,664
Retirement Benefits (including Social Security)	3,756	4,096	3,916	4,724	5,069	5,269
Health Insurance	1,420	1,569	1,817	1,867	1,837	1,917
Dental Insurance	17	38	67	145	164	247
Disability Insurance	30	60	93	117	142	132
Life Insurance	40	30	47	76	63	99
Total Compensation[3]	29,150	31,601	33,116	36,488	38,951	41,686

Source: Minnesota School Boards Association.

[1]Salary is base salary for regular school year. It excludes pay for extra duties.
[2]Employee cost only.
[3]Excludes workers compensation, unemployment compensation, severance pay, and other miscellaneous benefits.

- **Average teacher salaries were $34,022 in the Twin Cities area, compared with $28,769 in outstate school districts. Among outstate regions, salaries were highest in the Northeast ($30,931) and lowest in the Southwest ($27,069).**

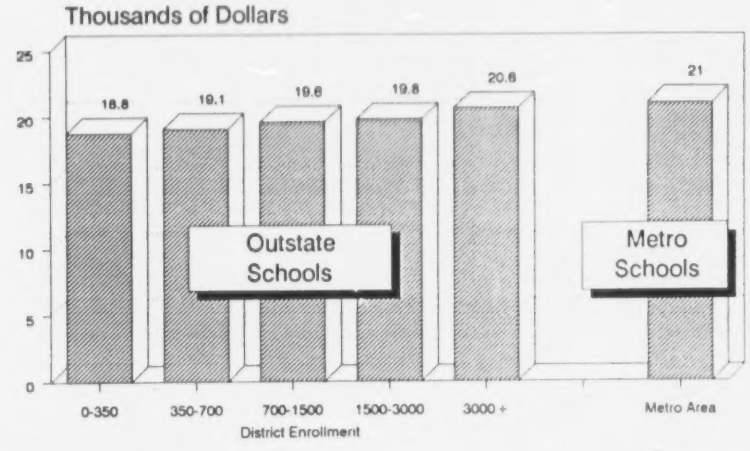
- **Average salaries steadily rise as district size increases. In 1988-89, outstate, small districts paid an average of $23,887, compared with $31,676 for large districts.**

In a previous study, *Statewide Cost of Living Differences,* we found that differences in teacher experience and training explained about half of the salary difference between the Twin Cities metropolitan area and outstate Minnesota.[4] For example, during the 1988-89 school year, 47 percent of the teachers in the Twin Cities metropolitan area had a master's degree, compared with 32 percent in outstate Minnesota. The other half was explained by higher salary schedules in the Twin Cities metropolitan area. We also found that differences in salary schedules corresponded to the cost-of-living differences among regions. As we discussed in the same report, salaries are one of several factors that affect the ability of schools to attract teachers to their district. We further explore the competitiveness of different school districts in Chapter 3, where we examine regional differences in teacher recruiting.

Figures 1.6 through 1.8 illustrate how pay schedules vary by type of district. For teachers with a bachelor's degree and no experience, salaries do not vary much among school districts. In 1988-89, the starting pay ranged from $18,784 in small outstate districts to $21,007 in the Twin Cities metropolitan area, a difference of 12 percent. In contrast, the maximum pay for teachers

Starting salaries for teachers do not vary across the state as much as salaries for experienced teachers.

Figure 1.6: Average Minimum Salary for Teachers with B.A. Degree by Type of District, 1988-89



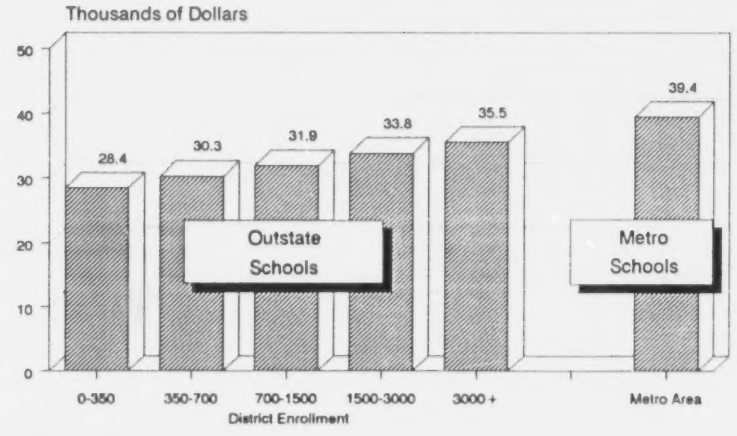
Sources: Department of Education and Minnesota School Boards Association

4 Office of the Legislative Auditor, *Statewide Cost of Living Differences,* (St. Paul, 1989).

with a master's degree ranged from $28,443 in small outstate districts to $39,420 in the metropolitan area, a difference of 39 percent. Differences for teachers with 30 or 60 credits beyond a master's degree were even larger than those shown.

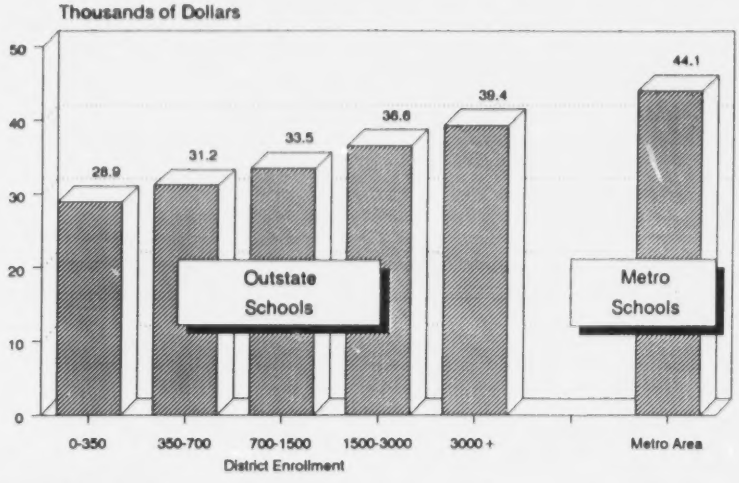
Maximum teacher salaries rise steadily as district size increases.

Figure 1.7: Average Maximum Salary for Teachers with M.A. Degree by Type of District, 1988-89



Sources: Department of Education and Minnesota School Boards Association

Figure 1.8: Average Maximum Teacher Salary by Type of District, 1988-89



Sources: Department of Education and Minnesota School Boards Association

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Variation in fringe benefits among school districts follows the same general pattern as salaries, as is shown in Tables 1.3 and 1.4. Retirement contributions follow the same pattern as salaries because school districts pay a constant percentage of salaries for teachers' retirement.

Larger school districts also pay more for insurance benefits, particularly for dental, disability, and life insurance. Compared with small outstate districts with less than 350 students, Twin Cities area districts pay about fourteen times as much for dental insurance, four times as much for disability insurance, and two and a half times as much for life insurance. The primary reason for these differences is that most small districts do not offer dental, disability, or life insurance.

Unlike salaries, insurance benefit costs are highest in northeast Minnesota rather than the Twin Cities area, which ranks second, slightly behind northeast Minnesota.

TEACHER COMPENSATION TRENDS: 1961-89

This section examines trends in teacher compensation, including salaries and fringe benefits. We cover fringe benefits as well as salaries because fringe benefits have become a larger part of total employee compensation.

To make meaningful comparisons over time, we adjust compensation data for inflation. However, if salaries of other workers increase substantially faster or slower than inflation, then inflation may not be the most appropriate comparison. As a result, we also compared growth in teacher salaries with growth in earnings of all other workers in the United States. Trends in average earnings for all Minnesota workers are not available, but national trends are also a reasonable comparison because the cost of living changes in Minnesota are similar to national changes.[5]

Salaries

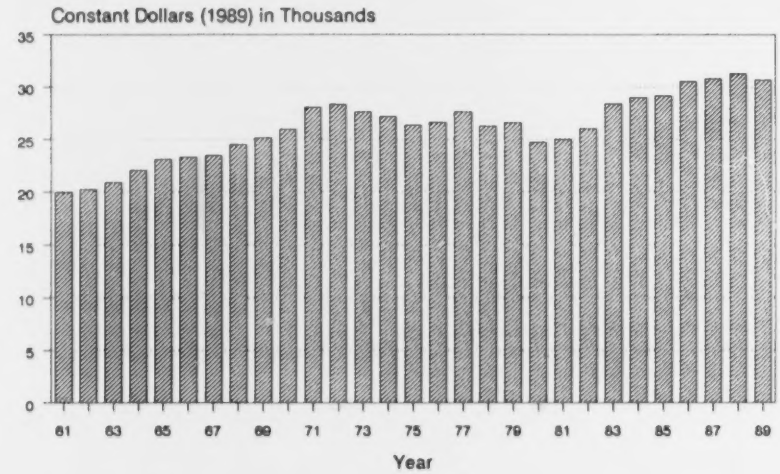
Average teacher salaries in Minnesota grew from $5,325 in 1960-61 to $30,660 in 1988-89, according to the National Education Association (NEA).[6] Figure 1.9 and Table 1.5 present the trend in teacher salaries after adjusting for inflation. They show that:

- **In constant dollars, teacher salaries in Minnesota grew from $19,942 in 1961 to $28,298 in 1972, declined to $24,667 in 1980 and went back up to $31,241 in 1988.**

5 From 1960-61 to 1988-89, the consumer price index for Minneapolis/St. Paul grew three percent faster than the national index.

6 National Education Association, *Ranking of the States* (Washington, D.C., published annually from 1961 to 1989).

Figure 1.9: Salary Trends for Minnesota Teachers, 1961-89



Source: National Education Association data adjusted by the CPI-U-X1 index

Gains in training and experience explain most of the real growth in teacher salaries between 1975 and 1989, but do not explain most of the growth between 1961 and 1975.

These results are consistent with the results of the study conducted by the Research Department of the Minnesota House of Representatives.[7] We used the NEA data because NEA has been reporting state average salaries for over 30 years, whereas 1974-75 is the earliest year in the Department of Education's data used by House Research. According to the House Research report, most of the real growth (after adjusting for inflation) in teacher salaries between 1974-75 and 1988-89 was due to gains in teacher experience and training. Real growth in teacher salaries during this period was 17.7 percent, but after adjusting for experience and training, it was 3.4 percent.

Teacher experience and training also explain part of the growth in salaries between 1961 and 1989, but it is doubtful that it explains most of the growth. National teacher data indicate that gains in teacher experience is less important in explaining increases in teacher salaries between 1961 and 1989 than it was between 1975 and 1989. The average years of teaching experience for teachers in the United States declined from 13 years in 1961 to 10 years in 1976, and then rose to 15 years in 1986.[8] These trends reflect the large growth in student enrollment during the 1960s and early 1970s, followed by declining enrollment during the late 1970s and early 1980s. Since enrollment changes in Minnesota followed the national pattern, Minnesota probably also followed the national trend in teacher experience.

7 Research Department of the Minnesota House of Representatives, *Teacher Salary Trends in Minnesota: 1974-1988.*

8 National Education Association, *Status of the American Public School Teacher, 1985-86* (Washington, D.C., 1987), 19.

Table 1.5: Salary Trends for Minnesota Teachers, U.S. Teachers, and all U.S. Employees, 1960-61 through 1988-89

	Minnesota Teachers		U.S. Teachers	U.S. Employees
	(Current Dollars)	(Constant Dollars)[1]	(Constant Dollars)	(Constant Dollars)
1960-61	$5,325	$19,942	$19,530	$18,350
1961-62	5,450	20,223	20,508	18,798
1962-63	5,700	20,894	21,023	19,265
1963-64	6,100	22,060	21,565	19,825
1964-65	6,460	23,052	22,249	20,392
1965-66	6,660	23,252	22,715	20,737
1966-67	6,910	23,417	23,146	20,963
1967-68	7,465	24,443	24,305	21,368
1968-69	8,000	25,141	24,991	21,925
1969-70	8,658	25,995	25,926	22,400
1970-71	9,778	28,071	26,610	22,871
1971-72	10,219	28,298	26,875	23,510
1972-73	10,422	27,568	26,886	23,873
1973-74	11,122	27,193	26,352	23,571
1974-75	11,756	26,350	26,106	23,351
1975-76	12,697	26,613	26,410	23,531
1976-77	13,963	27,596	26,398	23,727
1977-78	14,167	26,264	26,412	23,827
1978-79	15,509	26,557	25,783	23,717
1979-80	15,912	24,667	24,751	23,400
1980-81	17,777	24,985	24,722	23,198
1981-82	19,907	25,975	24,996	23,262
1982-83	22,876	28,396	25,726	23,439
1983-84	24,350	28,993	26,117	23,503
1984-85	25,450	29,156	27,031	23,568
1985-86	27,360	30,522	28,113	23,955
1986-87	28,340	30,765	28,828	24,352
1987-88	29,900	31,241	29,286	24,551
1988-89	30,660	30,660	29,648	24,483

Sources: National Education Association and Survey of Current Business.

[1]Based on the consumer price index for all urban consumers (CPI-U-XI Series 1967 through 1989, regular series prior to 1967).

Salaries have risen faster for teachers than for other employees.

Growth in Salaries and Fringe Benefits: 1968-69 to 1988-89

Table 1.6 compares teacher salaries and the employer cost of teacher fringe benefits between the 1968-69 and 1988-89 school years. We used Minnesota School Boards Association data to compare the cost of health, dental, long-term disability, and life insurance benefits. For social security (F.I.C.A.) and

Table 1.6: Growth in Teacher Compensation Between 1968-69 and 1988-89

	1968-69 (Current Dollars)	1968-69, After Adjustment for Inflation (in 1988-89 Dollars)	1988-89	Percent Change
Salary[1]	$8,000	$25,141	$30,660	22%
Total Fringe Benefits[2]	791	2,672	7,167	168
Retirement Benefits (includes Social Security)	668	2,099	4,954	136
Insurance Benefits[3]	123	573	2,208	285
Total Compensation[4]	$8,791	$27,813	$37,827	36%

Note: Salaries and retirement benefits were adjusted with the CPI-U-X1 index. Insurance fringe benefits were adjusted with the medical care component of the CPI index.

Sources: Salary data are from the National Education Association; fringe benefit data are from the Minnesota School Boards Association.

[1]Salary is base salary for regular school year. It excludes pay for extra duties.
[2]Employee cost only.
[3]Includes health, dental, disability, and life insurance.
[4]Excludes workers' compensation, unemployment compensation, severance pay, and other miscellaneous benefits.

The rapid growth in fringe benefits is an important part of the growth in teacher compensation.

regular retirement costs, we applied employer contribution rates for the appropriate year to the base teacher salary.[9]

Teacher fringe benefits have grown much faster than teacher salaries during the past twenty years. Table 1.6 shows that:

- **Teacher fringe benefits grew by 168 percent between 1968-69 and 1988-89.**
- **As a result of the rapid growth in fringe benefits, total teacher compensation grew by 36 percent during this time period, whereas salaries grew by just 22 percent.**

Between 1968-69 and 1988-89, insurance benefits (health, dental, life, and long-term disability) have grown more than three times as fast as the medical care portion of the consumer price index. Retirement contributions (social security and teacher retirement contributions) have increased more than twice as fast as inflation.

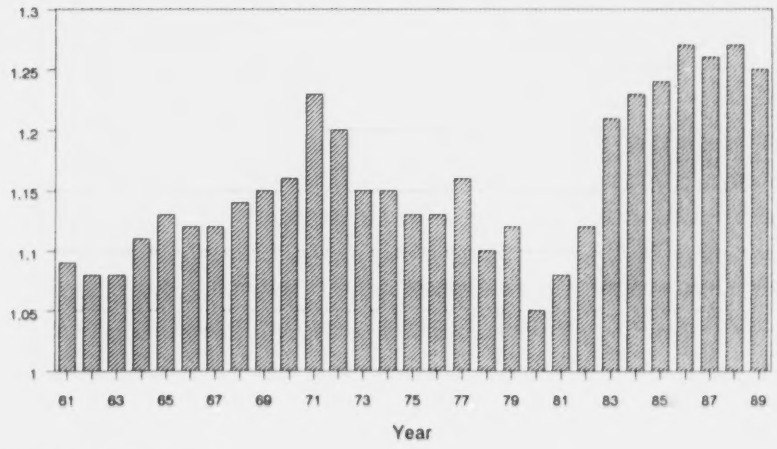
9 Since the maximum income subject to the social security tax was less than the salary earned by many teachers in 1968-69, we applied the tax rate to our estimate of the proportion of teacher salary subject to the tax.

Growth in Salaries of Teachers Compared with All Workers

Figure 1.10 and Table 1.5 compare teacher salaries in Minnesota with the average annual earnings of all workers in the United States from 1960-61 to 1988-89. Both averages are based on earnings for full-time workers (or full-time equivalents) and are adjusted for inflation. In 1988-89, Minnesota teacher salaries were about 25 percent higher than the annual average earnings (full-time equivalent) for all workers in the nation. The difference between teacher salaries and earnings of the average worker were larger during the late 1980s than any other time during the past thirty years. The ratio of teacher salaries to average earnings grew from 1.09 in 1961 to 1.23 in 1971, fell to 1.05 in 1980, and climbed to 1.27 in 1988.

The ratio of average salary of Minnesota teachers to that of all workers in the U.S. was larger in the late 1980s than any time in the past 30 years.

Figure 1.10: Ratio of Average Salary of Minnesota Teachers to U.S. Workers, 1961-89



Sources: National Education Association and Survey of Current Business

COMPARISONS WITH OTHER STATES

Each year, the American Federation of Teachers (AFT) and the National Education Association (NEA) collect average teacher salary data from all the states.[10] According to data from the American Federation of Teachers,

- In 1989-90, Minnesota's average teacher salary ranked 16th out of 50 states and the District of Columbia.

10 The American Federation of Teachers, *Survey and Analysis of Salary Trends, 1990* (Washington, D.C., 1990) and The National Education Association, *Rankings of the States* (Washington, D.C., 1990).

Minnesota's average salary was $32,190, about 3 percent higher than the national average ($31,315). Among neighboring states, Wisconsin ranked 14th, Iowa was 36th, North Dakota was 48th, and South Dakota was 51st.

These rankings are similar to those reported by NEA. In 1988-89, Minnesota ranked 16th in the nation, according to NEA data.

Since these rankings do not reflect differences in cost of living among the states, the AFT adjusted teacher salaries based on a cost-of-living index. The results show that:

- **After adjusting for cost-of-living differences, Minnesota's teacher salaries ranked 4th highest.**

Only Michigan, California, and Wisconsin ranked higher than Minnesota, after adjusting for cost-of-living differences.

STUDIES OF TEACHER PAY, TEACHER SUPPLY, AND STUDENT ACHIEVEMENT

Nationally, numerous studies examined the relationships among teacher pay, teacher supply, and student achievement during the 1970s and 1980s. In this section, we discuss the findings of many of these studies.

Higher teacher salaries attract more people to teaching.

Studies of the relationship between teacher salaries and the supply of teachers can be grouped into two categories: teacher surveys and empirical studies of how teachers respond to salary changes. Teacher surveys generally show that teachers rank salary behind other factors in their career decisions.[11] However, this does not necessarily mean that salary has little effect on teacher supply because it could still be the deciding factor for many prospective teachers. Also, the surveys do not measure how people actually behave in response to salary changes.

Empirical studies of teacher supply have found that teacher salaries in relation to other professional salaries have a substantial effect on career choice and teacher turnover.[12] These studies found that higher teacher salaries attracted more college students to the teaching profession. Several of these studies found that the effect was stronger for men than for women. One national study found that the salary differential between engineering and teaching is related to the presence of teacher shortages in science and mathematics.[13]

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11 Robert B. Kottkamp, Robert F. Provenzo, Jr., Marilyn M. Cohn, "Stability and Change in a Profession: Two Decades of Teacher Attitudes, 1964-84", *Phi Delta Kappan* 67 (April 1986).

12 James Ferris and Donald Winkler, "Teacher Compensation and the Supply of Teachers," *The Elementary School Journal* 86 (1986): 389-403; Zabalza, A., "The Determinants of Teacher Supply," *Review of Economic Studies 46* (1979): 131-147; Zabalza, Turnbull, and Williams, *The Economics of Teacher Supply* (Cambridge: Cambridge University Press, 1979); R. W. Eberts and J. A. Stone, *Unions and Public Schools* (Lexington, MA: Lexington Books, 1984).

13 Russell W. Rumberger, "The Impact of Salary Differentials on Teacher Shortages and Turnover: The Case of Mathematics and Science Teachers," *Economics of Education Review* 6 (1987): 389-399.

A longitudinal study investigated the turnover differences between teachers with high ability and low ability (as measured by test scores) and among teachers with different subject specialties.[14] It found large differences in turnover rates (and rates of return to teaching) among different subject areas. Elementary teachers tended to remain in teaching longer than other teachers and were more likely to return to teaching after they left. The study also found that teachers with high test scores were more likely to leave than teachers with low test scores. Salary increases reduced the turnover rates for all groups, but they influenced the turnover rates for low-ability teachers more than they did for high-ability teachers.

While research indicates that teacher salaries have an important effect on teacher supply, evidence that salaries affect student achievement is much weaker. Eric Hanushek and Richard Munrane have each summarized studies that examined the relationship between teacher pay and student achievement, including their methodologies and results.[15] Hanushek summarized the results of 187 studies that examined the relationship between student outcomes and a variety of factors, including teacher pay, teacher education, and teacher experience. To measure outcomes, 73 percent of these studies used standardized achievement test scores and 27 percent used some other measure such as student attitudes and percent going to college.

Many studies found that teachers with a bachelor's degree are just as effective, on average, as teachers with a master's degree.

They concluded that the amount of progress students make in school varies widely among schools and among teachers, even after controlling for student background. In other words, "schools matter" and "teachers matter."

Next they asked what school characteristics or teacher characteristics (including education, experience, and pay) explain these differences. Both Munrane and Hanushek concluded that teacher education beyond a bachelor's degree has little relationship with student achievement. Teachers with bachelor's degrees are just as effective, on average, as teachers with master's degrees. Out of 113 studies that examined teacher education and student outcomes, only 8 found a positive effect that was statistically significant. Among the remaining studies that reported the sign of the estimated effect, slightly less than half were positive.

Both Munrane and Hanushek found more positive evidence for teacher experience. Munrane concluded that experienced teachers tend to be more effective than inexperienced teachers. He found that most of the advantage due to experience occurs during the first two years of teaching.[16] Thereafter, the effect is small. Hanushek concluded that the effect of experience tends to be small, particularly after the first two years of a teacher's career. Out of 140 studies that measured the relationship between teacher experience and student outcomes, 40 found a positive effect that was statistically significant.

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14 Richard J. Munrane and Randall J. Olsen, "The Effects of Salaries and Opportunity Costs on Length of Stay in Teaching," *Journal of Human Resources* 25 (Winter 1990): 106-124.

15 Eric A. Hanushek, "Impact of Differential Expenditures on School Performance," *Educational Researcher* 18 (May 1989): 45-51; Hanushek, "The Economics of Schooling: Production and Efficiency in Public Schools," *Journal of Economic Literature* 24 (1986): 1141-1177; Hanushek, "Throwing Money at Schools," *Journal of Policy Analysis and Management* 1(1981) 19-41; Hanushek, "Conceptual and Empirical Issues in the Estimation of Educational Production Functions," *Journal of Human Resources* 14 (1979): 351-388; Richard J. Munrane, "Interpreting the Evidence on School Effectiveness," *Teachers College Record* 83 (1981): 19-35.

16 Richard J. Munrane, *Impact of School Resources on the Learning of Inner City Children* (Cambridge, MA: Ballinger, 1975).

Hanushek also found that most studies did not find a significant relationship between teacher salary and student outcome. Eleven out of 69 studies found a positive, statistically significant effect. However, Hanushek noted that these salary results are more difficult to interpret than the results for teacher education and experience. Most of these studies did not adjust salaries for price differences between school districts. Furthermore, teacher salary depends on teacher experience and education and is related to class size. This makes it harder to disentangle the effects of teacher pay.

Overall, these studies indicate that teacher characteristics that are easy to measure do not reliably distinguish between effective and ineffective teachers. Teacher experience, verbal ability, and some other characteristics tend to be related to teacher effectiveness, but they only explain a small portion of the differences among teachers. However, two studies found that principals' evaluations of teachers were highly correlated with student progress. While few studies examined this question, they suggest that principals can more reliably identify effective teachers than can easy-to-measure teacher characteristics such as training and experience.

Studies have not found that teacher pay has a major effect on student achievement.

These results are consistent with the work by Chubb and Moe.[17] Their study used a large national data base which has some important advantages over previous studies, including (1) its size (about 9000 students from over 500 schools), (2) its longitudinal design (including achievement tests during students' sophmore and senior years), and (3) data designed to measure important characteristics of a school's organization. They found that teacher pay and other economic resource factors did not distinguish effective schools from ineffective ones (as measured by average gains in student achievement). Instead, school organization along with socioeconomic background of students' parents, family background of the school's student body, and student ability all had important effects on student progress during high school. School organization was effective if the school had strong leadership, clear goals stressing academic excellence, staff professionalism and harmony, and educational practices such as few classroom disruptions and fair and effective discipline.

17 John E. Chubb and Terry M. Moe, *Politics, Markets, and America's Schools*, (Washington, D.C.: Brookings Institution, 1990).

PAY COMPARISONS

Chapter 2

A principal concern policy makers have with teacher pay is whether it is competitive with other occupations. If teacher pay is too low, schools may not be able to attract high-quality candidates to the teaching profession. If teacher pay is too high, school districts may not be able to hire enough teachers or buy enough equipment to meet the educational needs of their students. Pay is one of a variety of factors that prospective teachers consider when choosing a career. As a result, it is useful to examine teacher supply and demand as well as teacher pay before judging the competitiveness of teacher pay. We examine teacher supply and demand in Chapter 3. In this chapter, we compare the pay of Minnesota's public school teachers with the pay of other professional occupations and other college graduates. We ask:

- **How does the average work-year and work-day of teachers compare with other occupations?**
- **How does pay for teachers compare with pay for other professional and management related occupations? How does it compare with pay for other college graduates?**
- **How do teacher salaries in Minnesota's public schools compare with teachers in private schools and colleges?**

METHODS

To make salary comparisons, we had to address two basic questions: (1) With whom should teachers be compared? and (2) How should we handle differences in days worked per year and hours worked per day? These questions are discussed below.

With Whom Should Teachers be Compared?

Our purpose is to find out to what extent teacher pay is competitive with the pay of alternative occupations that prospective teachers may choose. We focused on jobs held by college graduates because schools must compete with these jobs to attract people to teaching. We restricted our comparisons to professional and managerial occupations because these are the occupations

college graduates usually choose. Professional and managerial occupations cover a wide range of jobs. This is appropriate since teachers specialize in a wide range of fields -- English, mathematics, science, social studies, business, art, and many others.

We also compared teachers with all college graduates, regardless of occupation. We included jobs in both the private and public sector. We compared teachers with Minnesota state employees because both groups are public employees and data are readily available for state employees. We also compared public K-12 teachers with private school teachers and college faculty.

We did not attempt to control for working conditions in our comparisons. Whether working conditions for teachers are better or worse than some other job involves preferences that vary greatly from person to person. Some people claim that teaching is often stressful because teachers must work with active children for seven hours a day, five days a week. Others cite the intrinsic rewards of teaching such as helping students develop and making a contribution to society.

Existing evidence on working conditions is mixed. One survey reported that teachers have higher levels of job stress than other adults. Another survey found that teachers have higher job satisfaction than other college graduates.[1] Ninety percent of public school teachers said they were satisfied with their jobs, compared with 80 percent for all college graduates. Therefore, we did not attempt to rank jobs according to their working conditions, but instead looked at the supply and demand for teachers in Minnesota. The number of people choosing teaching is an overall indicator of the attractiveness of teaching, including its working conditions and pay.

Our pay comparisons could be confounded by place of residence and job experience. Most of our comparisons do not control for salary differences or cost-of-living differences between metropolitan and non-metropolitan areas. Most teachers work in outstate Minnesota where salaries are below average. However, census data indicates that most other professionals work in the Twin Cities metropolitan area, where salaries are above average.[2] As a result, statewide comparisons would tend to make teacher salaries rank lower than they would if comparisons were confined to the same geograhic area.

On the other hand, teachers may have more job experience than other professional employees. Since experienced employees tend to earn higher salaries than inexperienced employees, comparing experienced teachers with less experienced employees in other professions would tend to make teacher salaries rank higher than they would if experience were the same. However, data on job experience are not very good. Furthermore, there is no consensus on how much value to place on experience at different jobs. As we discussed in Chapter 1, studies have found little relationship between experience and effectiveness after the first few years of teaching.

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1 U.S. Department of Education, National Center for Education Information, *Profiles of Teachers in the U.S.*, (Washington: 1986) 19.

2 Based on the 1980 census.

These two effects (place of residence and job experience) work in opposite directions, so that they may offset each other. Available data are not adequate to determine which effect is larger.

Some of our comparisons control for geographic location. The salary survey conducted by the Department of Jobs and Training gives salary data for six regions of Minnesota. However, sample size is a problem for several occupations in the outstate regions, making regional comparisons less reliable than statewide or national comparisons.

Differences in Days and Hours Worked

Many studies of teacher pay use annual salary to compare teachers with other professionals. This method is not a fair comparison because it does not recognize the value of a long summer vacation for teachers. Furthermore, the base annual salary does not include additional pay for extra duties at school nor pay for other jobs. To compensate for the long summer vacation, pay comparisons can be adjusted according to the number of days worked per year. However, this method has drawn a number of criticisms. First, it does not recognize the extra hours teachers spend grading papers and preparing for classes outside the normal school day. If adjustments are made for different work years, they should also be made for different work days. Therefore, we examined evidence on total hours worked by teachers and other professionals.

Most teachers prefer a long summer vacation rather than working year-round with more pay.

A second criticism is that teachers normally could not earn as high a wage on summer jobs as they could on year-round jobs. As a result, salary comparisons on an hourly basis may overstate the earnings potential of teachers. However, teachers' base annual salary understates their earning potential. In addition, this argument is not relevant for those who prefer not to work during the summer. According to a national survey by the National Center for Education Information, 79 percent of teachers surveyed said they preferred a 9 or 10 month contract instead of more money and a 12 month contract (with other professional activities during the summer months).[3] For those who prefer a long summer vacation, the hourly pay comparison is the appropriate comparison. For teachers who prefer to work year-round, the appropriate comparison is not as clear. Their earnings' potential would depend on the type of second job that they could find. As a result, we will present both hourly and annual pay comparisons. Annual comparisons allow one to judge whether any pay differences could be made up with summer employment. But, overall, we consider the hourly comparisons to be the more appropriate comparison.

In the remainder of this chapter, we examine survey evidence on how long employees work on the job for different occupations. Next we present pay comparisons for a broad range of professional and managerial occupations.

3 U.S. Department of Education, National Center for Education Information, *Profile of Teachers in the U.S.*, (Washington, 1986).

WORK YEAR AND WORKWEEK COMPARISONS

Work Year

To measure an employee's work year, we counted days that employees are required to be at work. For teachers, this includes class days and teacher workshop or in-service days. During the 1988-89 school year, the average work year for teachers was 182 days, according to Minnesota School Boards Association data. This includes an adjustment of one day for personal leave. No adjustment was made for sick-leave days.

The average work year was 182 days for Minnesota teachers, compared with 235 days for professional employees in the private sector.

Teachers must spend 125 hours every five years (25 hours per year) on approved educational activities to keep their teaching license. We did not count time spent meeting such continuing education requirements in our work-year estimates because we do not have data on the requirements for other professions.

For other professionals, we assumed they worked five days a week except for holidays and vacation days. National surveys and data from the Minnesota Department of Employee Relations indicate that:

- The average work year for full-time salaried employees in the private sector was about 235 days, 29 percent longer than the average work year for teachers in Minnesota.
- The average work year for state professional employees in Minnesota was 232.2 days, 28 percent longer than the average work year for teachers.

A national survey by the U.S. Bureau of Labor Statistics indicates that employees in professional, technical, and managerial occupations received an average of 22.5 holidays and vacation days per year.[4] This estimate would probably be higher if part-time workers and technicians were not included in the employee category used for this estimate. As a result, we adjusted the estimate to 25 days.

Data from the Minnesota Department of Employee Relations show that professional state employees received an average of 11 holidays and 16.8 vacation days.

4 U.S. Department of Labor, Bureau of Labor Statistics, *News, Employer Costs for Employee Compensation - March 1989*, (Washington, 1989). The bureau publishes the number of paid leave days for these occupional categories. To obtain vacation days and holidays, we assumed that the number of sick leave and miscellaneous paid leave days was the same as reported for all white collar workers.

Workweek

To estimate the number of hours worked by teachers and other professionals, we used large national surveys that asked employees to report the number of hours they worked during the previous week (or during a typical week). These surveys are large enough to be representative of the nation's teachers and other professionals. However, self-reported surveys rely on employees to remember how they spent their time during a week. The accuracy of these workweek estimates is unknown. Nevertheless, these surveys have the best available evidence concerning employees' workweek.

Two national teacher surveys measured hours worked by teachers during and after regular school hours.

- A survey conducted by the National Education Association in 1986 found that teachers spent an average of 44.5 hours per week on school-related activities, excluding compensated activities after school (such as coaching).[5]

- A survey conducted for the U.S. Department of Education found that full-time teachers worked about 46.5 hours per week, excluding extra-curricular activities after regular school hours.[6]

Self-reported surveys indicate that teachers work 2.5 hours more per week than other professionals.

Hourly comparisons in this report are based on the 46.5 hour workweek found in the second study because the second study included only full-time teachers whereas the first study included teachers working at least half-time.

According to the Current Population Survey conducted by the U.S. Bureau of Labor Statistics, full-time employees in professional and managerial occupations worked an average of 45.2 hours per week during the three year period, 1987-89. To obtain the number of hours worked at the employee's primary job, we used data on multiple jobholders from the Current Population Survey.[7] After adjusting for hours worked on secondary jobs, we estimate that:

- Full-time employees in professional and managerial occupations worked an average of 44 hours per week on their primary job.

In other words, for the purposes of our research, we assume that, on average, teachers work 2.5 hours more per week than other professionals.

5 National Education Association, *Status of the American Public School Teacher, 1985-86*, (Washington D.C.: National Education Association, 1987).

6 U.S. Department of Education, National Center for Education Statistics, *Time Allocation Patterns of Teachers in Public and Private Schools: 1984-86*. (Washington D.C., 1989).

7 U.S. Department of Labor, Bureau of Labor Statistics, *News, Multiple Jobholding Reached Record High in May 1989*, (Washington, 1989).

COMPENSATION COMPARISONS WITH PROFESSIONAL AND MANAGERIAL JOBS

In this section, we use both Minnesota and national surveys to compare compensation of professional and managerial occupations with Minnesota teachers. We compare fringe benefits as well as salaries. We obtained salary data for Minnesota's professionals from employer surveys conducted by the Department of Jobs and Training. The surveys report salaries for a variety of professional occupations in most private industries, the federal government, and local government.[8] It allows comparisons to be made within the same geographic area, including individual regions of the state.

To make comparisons with employees nationwide, we used the Current Population Survey, a large nationwide survey of households conducted by the Bureau of Labor Statistics. Comparisons with national data are appropriate because average pay in Minnesota is close to the national average and the national survey has some important advantages over the Minnesota survey. According to data from the Bureau of Labor Statistics, in 1989, the average annual wages and salaries for Minnesota workers was 1.8 percent less than the national average.[9]

One advantage of the Current Population Survey is that it has a lower non-response rate than the Minnesota survey. The Current Population Survey's non-response rate was 28 percent, compared with 48 percent for the Minnesota survey.[10] High non-response rates are a concern because it is not known how those who do not respond compare with those who do respond. This potential non-response bias is a problem for both surveys, but particularly for the Minnesota survey.

Another advantage of the Current Population Survey is that the accuracy of its estimates has been more closely examined. Data from Internal Revenue Service W-2 forms are consistent with results of the Current Population Survey.[11] Little has been done to check the accuracy of the Minnesota survey.

Finally, the Current Population Survey allows comparisons to be made with all college graduates and all employeees in professional and managerial occupations.

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8 The survey includes major private industries except agriculture and eating and drinking places. It also includes hospitals, nursing homes, federal, city, and county governments, and education. It does not include state government.

9 U.S. Department of Labor, Bureau of Labor Statistics, *Average Annual Pay By State and Industry, 1989* (Washington, August 1990).

10 Sar A. Levitan and Frank Gallo, *Workforce Statistics: Do We Know What We Think We Know--And What Should We Know*, (Washington, D.C.: U.S. Congress, Joint Economic Committee, December 26, 1989) 14, and Minnesota Department of Jobs and Training, Minnesota Salary Survey by Area 1989 and Minnesota Survey of Hospitals and Nursing Homes 1989, (St. Paul, 1989) (based on share of employees working for employers who did not respond).

11 Levitan and Gallo, *Workforce Statistics*, 13-14.

National Comparisons

National surveys indicate that, on average, Minnesota teachers have higher fringe benefits and higher hourly wages than other employees with professional and managerial jobs. We summarize the results of salary and fringe benefit comparisons below.

Salary Comparisons

Table 2.1 compares salaries of teachers with those of professional and managerial occupations. Comparisons include full-time employees only. We

The median hourly salary for Minnesota teachers was nine percent higher than that for other college graduates.

Table 2.1: Salary Comparisons--Minnesota Teachers, U.S. College Graduates, and Employees in Professional and Managerial Occupations, 1988-89

	Full-Time Employees		
	Number of Employees (in 000's)	Median Salary	
		Hourly	Annual
Minnesota Teachers	39.4	$18.18	$30,769
U.S. College Graduates, 25 years and over (excludes teachers)	17,498	16.74	34,617
Professional, Executive, Administrative, and Managerial Occupations (excludes teachers)	19,788	15.76	32,590
Health Diagnosing Occupations (includes physicians, dentists)	640	32.42	67,045
Lawyers and Judges	637	26.27	54,325
Engineers	1,677	20.15	41,664
Natural Scientists, Mathematicians	969	18.87	39,019
Administrators and Officials, Private Sector	7,382	17.02	35,188
Architects and Surveyors	115	16.36	33,823
Public Administrators and Officials	481	15.27	31,581
Accountants and Auditors	1,139	14.80	30,598
Health Assessment and Treatment Occupations (includes registered nurses, therapists)	1,457	14.11	29,182
Other Management-Related Occupations	1,944	13.46	27,826
Other Professional Occupations (includes social workers, social scientists, librarians, writers, artists, entertainers, and athletes)	2,444	12.32	25,473
Self-Employed Administrators and Officials	905	11.30	23,377

Source: U.S. Department of Labor, Bureau of Labor Statistics, Current Population Survey, 1987, 1988, and 1989.

used the median to avoid distortions that otherwise might be caused by very highly-paid executives and professionals.[12] The table shows that:

- **In 1988-89, the median teacher pay in Minnesota exceeded the median hourly pay for professional and managerial occupations by 15 percent.**

- **The median teacher pay exceeded the median hourly pay for other college graduates (25 years and older) by 9 percent.**

Health diagnosing occupations (includes doctors and dentists) and lawyers and judges had substantially higher pay than teachers. Other occupational categories with higher median hourly pay than teachers were engineers (11 percent higher) and natural scientists and mathematicians (4 percent higher).

The median annual salary for Minnesota teachers was $1,821 less than the median for other professional and managerial occupations and $3,848 less than other college graduates.

All of the above comparisons are based on median salaries. Comparisons of salary distributions, reported in Table 2.2, show that salaries of other professionals are much more widely dispersed than teacher salaries. For example, ten percent of employees in professional and managerial jobs earned more than $33 per hour ($69,000 per year), whereas no teachers earned this much (from their base salary during the regular school year). The top ten percent among teachers earned more than $24 per hour ($41,000 per year).

Salaries for other professionals are more widely dispersed than teacher salaries.

Table 2.2: Distribution of Salaries--Minnesota Teachers Compared with U.S. Professionals, 1988-89

	Hourly Wage		Annual Salary	
Percentiles	Minnesota Teachers	Professional and Managerial Occupations	Minnesota Teachers	Professional and Managerial Occupations
10	$13.00	$7.11	$21,989	$14,713
25	15.17	10.67	25,685	22,068
50	18.18	15.76	30,769	32,590
75	21.77	23.12	36,842	47,809
90	24.13	33.24	40,838	68,745

Note: Teacher salaries are base salary for regular school year. They exclude pay for extra duties.

Sources: House Research Department for Minnesota teachers; U.S. Bureau of Labor Statistics, Current Population Survey for professional and managerial occupations.

12 The median salary of a particular occupation is the salary which is exceeded by 50 percent of the employees in that occupation.

Fringe Benefit Comparisons

To estimate fringe benefit costs for private sector employees, we used the employment cost index survey of 4,400 establishments conducted by the U.S. Bureau of Labor Statistics in March 1989.[13] We used average employer fringe benefit costs for professional, technical, and managerial occupations. Fringe benefit cost comparisons presented in Table 2.3 show that:

- **Private sector fringe benefit costs are lower than teacher fringe benefit costs.**

Table 2.3: Annual Fringe Benefit Cost Comparisons--Teachers and Private Sector Employees, 1988-89

		U.S. Private Sector	
	Minnesota Teachers	Professional and Technical Occupations	Managerial Occupations
Insurance Benefits	$2,213	$2,129	$2,211
Retirement and Savings (excludes Social Security)	2,805[a]	1,289	1,523
Total	$5,018	$3,418	$3,734
Retirement and Savings as percent of gross payroll	8.98%[a]	3.85%	3.91%

Sources: Minnesota School Boards Association; Teachers Retirement Association; and U.S. Bureau of Labor Statistics, Employer Cost Index Survey.

[a]Based on the Teachers Retirement Association's rate. Minneapolis, St. Paul, and Duluth have different rates. We excluded these because they have an unusually large number of teachers who pay high rates because they do not participate in Social Security. On July 1, 1990, the employer contribution rate for the Teachers Retirement Associaion became 8.14 percent.

Fringe benefit costs for private-sector professionals are lower because of lower retirement benefit costs.

The reason that private sector fringe benefit costs are lower is that retirement benefit costs are substantially lower in the private sector than they are for Minnesota teachers. The national survey found that retirement benefits (excluding social security) cost employers an average of 3.88 percent of gross payroll. During the 1988-89 school year, school districts paid the Teachers Retirement Association 8.98 percent of gross payroll, including 4.48 percent for amortization of the retirement fund's deficit (in 1990-91, the cost is 8.14 percent of gross payroll, including 3.64 percent for amortization of the deficit).[14]

Estimated annual average costs for medical, disability, and life insurance were $2,129 to $2,211 per full-time employee in the private sector, nearly the same as the cost for teachers ($2,212).

13 U.S. Department of Labor, Bureau of Labor Statistics, *News, Employer Costs for Employee Compensation - March 1989*. The survey has a response rate of 68 percent.

14 These rates apply to all school districts except Minneapolis, St. Paul, and Duluth.

Average Salaries in Minnesota

Table 2.4 presents average hourly and annual salaries for teachers and 26 other professional occupations, based on the 1989 employer survey by the Department of Jobs and Training. The table does not include fringe benefits. Most of these occupations require a four-year college degree. Exceptions include registered nurses, who are not required to have a college degree, attorneys, who must complete seven years of college education, and pharmacists, who often must complete a five-year program. The table shows that:

- **In 1989, 20 out of 26 occupations surveyed (73 percent) had lower median pay per hour than teachers.**

Professionals with higher pay than teachers include nurse anesthetists, lawyers, engineers (chemical and civil), pharmacists, psychologists, and systems analysts.

Table 2.4: Salary Comparisons--Teachers and Other Professionals in Minnesota, 1988-89

Occupation	Number of Employees In Sample	Median Salary Hourly	Median Salary Annual
Nurse, Anesthetist	401	$24.35	$50,357
Lawyer (non-owner)	743	23.27	48,131
Engineer, Chemical	98	22.80	47,154
Engineer, Civil	733	18.67	38,605
Pharmacist	564	18.61	38,480
Psychologist	267	18.32	37,877
Systems Analyst	1,588	18.19	37,627
Teachers	39,400	18.18	30,769
Engineer, Mechanical	795	17.54	36,275
Engineer, Electrical	584	17.54	36,275
Engineer, Industrial	452	16.66	34,445
Nurse, Supervisory	1,360	16.38	33,883
Chemist	268	16.14	33,384
Loan Officer/Counselor	560	15.56	32,178
Technical Writer	234	15.44	31,928
Librarian	936	14.95	30,909
Physical Therapist	296	14.86	30,722
Underwriter	358	14.80	30,597
Writer	237	14.08	29,102
Registered Nurse	15,937	13.82	28,579
Reporter	253	13.60	28,122
Dietitian	266	13.21	27,310
Accountants	2,447	13.16	27,206
Occupational Therapist	330	12.97	26,832
Social Worker	2,313	12.63	26,125
Commercial Artist	274	12.34	25,522
Claims Adjuster	460	11.96	24,731

Source: 1989 Salary Survey by the Department of Jobs and Training.

Professionals with higher median hourly salaries than teachers were nurse anesthetists, lawyers, chemical engineers, systems analysts, civil engineers, pharmacists, and psychologists. Salaries for electrical and mechanical engineers were about four percent less than the median salary for teachers. These results are consistent with salaries reported from the 1988 survey except for electrical engineers, which had higher pay than teachers. The difference could be due to different employers responding to the survey rather than a real decline in salary for electrical engineers.

Eleven out of 26 professional occupations had lower median annual salaries than teachers.

Eleven out of the twenty-six professional occupations had lower annual salaries than teachers. Hourly wages for each of these occupations were more than 18 percent less than teachers' wages.

These results are generally consistent with the national comparisons, though Minnesota's survey tends to report lower salaries than the national survey. Most job categories had lower hourly pay than teachers. Jobs with higher pay require college degrees in a technical field or require more than a bachelor's degree.

Engineers, accountants, and architects, the three occupations that were grouped into comparable categories, all had lower salaries in the Minnesota survey. For example, the median salary of engineers reported by the Minnesota survey was 13 percent lower than the national median. To what extent this is due to real geographic differences is not clear. Differences in how each survey classifies employees or non-response bias could also be responsible.

Regional Comparisons

The Department of Jobs and Training's survey reports median salaries by region in Minnesota. Salary comparisons presented in Tables 2.5 and 2.6 show that:

- **In the Twin Cities area, 4 out of 26 occupations had higher hourly pay than teachers. In outstate Minnesota, 6 out of 26 occupations had higher pay.**

Only nurse anesthetists and chemical engineers had higher wages per hour than teachers in both the Twin Cities area and outstate Minnesota. Lawyers and reporters had higher wages in the Twin Cities area but not outstate. Civil engineers, pharmacists, psychologists, and electrical engineers had higher wages than teachers in outstate Minnesota, but not in the Twin Cities area.

Beginning Salaries: Teachers and College Graduates

To obtain beginning salary data for college graduates, we used a survey of college graduates from the class of 1986 conducted by the U.S. Department of Education in 1987.[15] We adjusted the 1987 salaries for inflation to make them

15 U.S. Department of Education, National Center for Education Statistics, *Occupational and Educational Outcomes of 1985-86 Bachelor's Degree Recipients*, (Washington, 1989).

Table 2.5: Salary Comparisons--Teachers and Other Professionals in the Twin Cities Metropolitan Area, 1988-89

Occupation	Number of Employees In Sample	Median Salary Hourly	Median Salary Annual
Lawyer (non-owner)	618	$24.76	$51,210
Nurse, Anesthetist	267	24.63	50,939
Engineer, Chemical	75	22.92	47,403
Reporter	160	21.93	45,344
Teacher	17,416	21.05	35,635
Systems Analyst	1,390	18.80	38,875
Pharmacist	309	18.66	38,584
Engineer, Civil	596	18.38	38,002
Psychologist	137	18.25	37,731
Chemist	179	18.22	37,669
Nurse, Supervisory	494	17.75	36,712
Engineer, Industrial	241	17.60	36,400
Engineer, Electrical	405	17.54	36,275
Engineer, Mechanical	631	17.54	36,275
Loan Officer/Counselor	338	16.72	34,570
Technical Writer	211	15.84	32,760
Librarian	446	15.68	32,427
Underwriter	330	15.15	31,325
Writer	194	15.13	31,283
Physical Therapist	122	14.86	30,722
Social Worker	1,210	14.46	29,910
Commercial Artist	191	14.08	29,120
Registered Nurse	8,858	13.82	28,579
Accountant	1,720	13.42	27,747
Dietitian	122	13.21	27,310
Occupational Therapist	214	13.11	27,102
Claims Adjuster	435	11.86	24,523

Source: 1989 Salary Survey by the Department of Jobs and Training.

In the Twin Cities area, 4 out of 26 occupations had higher hourly pay than teaching; 13 had higher annual pay.

comparable to 1988-89 salaries. Salary comparisons, presented in Table 2.7, show that:

- **The average salary of college graduates (bachelor's degree) employed full-time was $10.53 per hour, about nine percent less than the average starting salary ($12.02 per hour) for a Minnesota teacher with a bachelor's degree.**

Engineering graduates earned, on average, 12 percent more than Minnesota teachers earned per hour. Average salaries for all other fields were lower than teacher salaries on an hourly basis. Graduates from health professions, physical sciences, mathematics, and computer sciences earned about five percent less than teachers per hour. Business students earned about 10 percent

In outstate Minnesota, 6 out of 26 occupations had higher hourly pay than teaching; 13 had higher annual pay.

Table 2.6: Salary Comparisons--Teachers and Other Professionals in Outstate Minnesota, 1988-89

Occupation	Number of Employees In Sample	Median Salary Hourly	Median Salary Annual
Nurse, Anesthetist	134	$24.17	$49,982
Engineer, Civil	137	19.30	39,915
Engineer, Chemical	23	19.03	39,354
Psychologist	130	18.38	38,002
Engineer, Electrical	179	18.23	37,690
Pharmacist	255	18.21	37,648
Teacher	21,984	17.07	28,885
Engineer, Mechanical	164	16.44	34,008
Systems Analyst	198	16.10	33,301
Lawyer (non-owner)	125	15.47	31,990
Nurse, Supervisory	866	15.41	31,866
Loan Officer/Counselor	222	15.27	31,574
Engineer, Industrial	211	15.09	31,200
Physical Therapist	174	15.09	31,200
Librarian	490	14.02	28,995
Claims Adjuster	25	13.71	28,350
Registered Nurse	7,079	13.13	27,144
Dietitian	144	13.12	27,123
Underwriter	28	12.76	26,395
Accountant	727	12.57	26,000
Occupational Therapist	116	12.57	26,000
Chemist	89	12.42	25,688
Social Worker	1,103	11.15	23,067
Technical Writer	23	11.12	23,005
Commercial Artist	83	10.53	21,778
Writer	43	8.80	18,200
Reporter	93	8.70	17,992

Source: 1989 Salary Survey by the Department of Jobs and Training.

less than Minnesota teachers earned. Graduates from other fields earned, on average, from 14 to 32 percent less than teachers per hour.

On an annual basis, Minnesota starting teacher salaries were about $2,000 less than the average salary for college graduates. Most teachers could earn more than $2,000 during the summer if they wanted to work year-round.

COMPARISON WITH STATE JOBS

In this section, we compare salaries and fringe benefits of teachers with state employees in Minnesota. As in the previous section, we restricted com-

Table 2.7: Salary Comparisons--Beginning Teachers in Minnesota and U.S. College Graduates One Year after Graduation, 1988-89

	Bachelor's Degree Conferred (1986)	Average Salary of Full-Time Employees	
		Per Hour	Annual
Minnesota Teachers with B.A. and no experience		$12.02	$20,338
U.S. College Graduates by Field of Study			
Engineering	95,953	13.49	28,462
Health Professions	64,535	11.46	24,182
Math, Computer Sciences, Physical Sciences	79,926	11.41	24,075
Business & Management	238,160	10.70	22,577
Social Sciences	93,703	10.29	21,721
Public Affairs/Social Services	26,582	8.97	18,939
Other	128,372	8.92	18,832
Psychology	40,521	8.77	18,511
Biological Sciences	38,524	8.32	17,548
Humanities	94,326	8.21	17,334
Total (All fields except education)	900,602	$10.53	$22,212

Sources: Minnesota Department of Education and National Center for Education Statistics, College Graduates Survey.

Note: The survey reports 1987 salaries of 1985-86 bachelor's degree recipients employed full-time. To make salaries comparable to 1988-89 salaries, we multiplied 1987 salaries by 1.07, the ratio of average earnings in 1988-89 to the average in 1987.

Starting hourly pay for teachers is higher, on average, than starting pay for college graduates.

parisons to professional, supervisory, and managerial job classes.[16] These classes cover a broad range of occupations, ranging as high as assistant commissioners. The most common professional occupations in state government are engineers and registered nurses.

We obtained average salaries for state employees as of January 1989, which is close to the middle of the 1988-89 school year. The salary data, obtained from the Department of Employee Relations, were broken down by job position. We converted annual salaries for state employees to hourly wages based on the method described earlier in this chapter. We assumed that the average work year was 232.8 days and the average work week was 44 hours.

To calculate the retirement benefit cost for 1988-89, we applied the employer contribution rates to the average salary. The state paid 7.51 percent of payroll for social security (FICA) and 3.9 percent for the general retirement plan of the Minnesota State Retirement System. For insurance benefits

16 We included jobs from these three classes with 238 or more Hay points, based on the Hay job evaluation system. A typical job with 238 points is designed for a college graduate with no experience. Some common examples are entry-level social workers, planners, and personnel officers. Registered nurses are also included even though a four-year college degree is not required.

(health, dental, life, and disability), we used data from the Deparment of Employee Relations to calculate the average state cost for all state employees.

Teachers' hourly wage, on average, exceeded that of state professional, supervisory, and managerial employees by eleven percent.

Salary and fringe benefit comparisons for 1988-89, summarized in Tables 2.8 and 2.9, show that:

- **On an hourly basis, the average total compensation for teachers was 15 percent higher than the average for professional, supervisory, and managerial state employees. Teachers' average wage rate was 11 percent higher and average fringe benefit cost was 37 percent higher than the state average.**

Table 2.8: Hourly Compensation Comparisons--Teachers and State Employees, 1988-89

		State Employees	
	Teachers	Professionals	Professionals, Supervisors, and Managers
Salary	$18.45	$15.60	$16.59
Fringe Benefits	4.23	2.98	3.09
Retirement Benefits[1]	2.93	1.78	1.89
Insurance Benefits			
Health	1.09	1.00	1.00
Dental	.10	.12	.12
Life	.04	.08	.08
Disability	.07	.0	.0
Total Compensation	$22.69	$18.54	$19.69

Note: Fringe benefit costs include employer costs only.

Sources: Department of Employee Relations and Minnesota School Boards Association.

[1]Includes Social Security.

On an annual basis, the average teacher salary was close to the average for professional state employees. If supervisors and managers were included in the state average, teachers' total compensation was $1,820 less than the state average. If supervisors and managers were excluded, teachers' total compensation slightly exceeded the average for state professional employees.

Annual fringe benefit costs for teachers were 13 percent higher than the average cost for state employees.

The average annual fringe benefit cost for teachers ($7,171) exceeded the average for state employees ($6,320) by 13 percent. Employer contributions for fringe benefits are higher for teachers than state employees because of the higher cost of retirement benefits. Employer costs for teacher retirement benefits are higher both because contributions for prior fund deficits are higher and because the normal cost (the actuarially sound cost if there were no fund deficit) is higher. The normal cost for teacher retirement is 36 percent higher even though the benefit plans are essentially the same. The reason appears to be that state employees have higher turnover rates than teachers. Under both retirement systems, employees who change jobs and leave the retirement system can take their own contribution but not the

Table 2.9: Annual Compensation Comparisons--Teachers and State Employees, 1988-89

		State Employees	
	Teachers	Professionals	Professionals, Supervisors, and Managers
Salary	$31,233	$31,886	$33,904
Fringe Benefits	7,167	6,090	6,320
Retirement[1]	4,954	3,638	3,868
Health	1,845	2,041	2,041
Dental	174	253	253
Life	76	158	158
Disability	118	0	0
Total Compensation	$38,400	$37,976	$40,224

Note: Fringe benefit costs include employer costs only.

Source: Department of Employee Relations and Minnesota School Boards Association.

[1]Includes Social Security.

employer's contibution. Vested employees who choose to remain in the retirement system still do not receive full benefits because of inflation.

The average annual insurance benefit cost (including health, dental, life, and disability insurance) for state employees was $2,452, about 11 percent higher than the average for teachers ($2,212).

Salary comparisons for specific occupations, shown in Table 2.10, generally follow the pattern we found for non-state employees in Minnesota. Most jobs paid lower hourly wages than the average teacher wage. State jobs with higher average hourly wages than teaching include engineers (who make up nearly 10 percent of state professional employees), systems analysts, and attorneys.

Occupations with lower average annual salaries than teachers include: biologists, chemists, registered nurses, occupational therapists, speech pathologists, social workers, park naturalists, park supervisors, and specialists in wildlife management and fishery management.

COMPARISON WITH PRIVATE SCHOOL TEACHERS

During the 1989-90 school year, private schools in Minnesota enrolled 80,650 students, about 10 percent of the total K-12 enrollment. Catholic schools en-

Table 2.10: Salary Comparisons--Teachers and Selected Job Classes in Minnesota State Government, 1988-89

Job Class	Number of Employees	Mean Salary Hourly	Mean Salary Annual
Systems Analyst	100	$19.98	$40,833
Engineer	784	19.57	39,993
Attorney	87	18.82	38,459
Pharmacist	39	18.20	37,187
Teacher	39,400	18.45	31,233
Psychologist	94	17.82	36,417
Hydrologist	124	17.08	34,892
Management Analyst	145	16.37	33,445
Landscape Architect	15	16.10	32,899
Dietitian/Nutritionist	43	15.90	32,492
Bacteriologist	18	15.84	32,362
Epidemiologist	22	15.74	32,160
Rehabilitation Counselor	275	15.43	31,528
Tax Examiner	57	15.42	31,505
Planner	165	15.36	31,388
Accountant	267	15.30	31,256
Auditor	329	15.20	31,059
Financial Inst. Examiner	61	15.19	31,030
Research Analyst	179	14.97	30,604
Registered Nurse	661	14.96	30,569
Revenue Tax Supervisor	144	14.91	30,482
Park Supervisor	70	14.80	30,252
Unemployment Tax Examiner	46	14.71	30,065
Wildlife Management	100	14.58	29,781
Fishery Management	95	14.24	29,092
Social Worker	153	13.76	28,126
Chemist	21	13.76	28,129
Pollution Control Specialist	179	13.59	27,778
Occupational Therapist	21	13.53	27,633
Speech Pathologist	11	13.37	27,316
Biologist	64	13.25	27,075
Park Naturalist	16	13.10	26,766
Revenue Examiner	99	13.00	26,560

Source: Department of Employee Relations.

State jobs with higher hourly pay than teachers include system analysts, engineers, attorneys, and pharmacists.

rolled about 64 percent of the private school students and Lutheran schools enrolled 14 percent. We obtained salary data for all Catholic schools in the state except for elementary schools outside the St. Paul/Minneapolis Archdiocese. For Lutheran schools, we obtained data for only four out of 130 schools. We also collected salary data for three private, non-sectarian schools in the Twin Cities area. Table 2.11 compares teacher salaries for public K-12 schools with salaries for private schools.

- **Public schools pay teachers substantially higher salaries than most private schools.**

Table 2.11: Salary Comparisons--Public and Private School Teachers, Minnesota, 1988-89

	Median Annual Salaries		
	Twin Cities Area	Outstate Minnesota	State Total
Public Schools	$35,635	$28,885	$30,769
Catholic High Schools	23,816	19,722	22,590
Catholic Elementary Schools [1]	16,605	-	-
Lutheran High Schools[2]	-	-	20,009
Private College-Prep Schools	33,289	-	-

Sources: Catholic School Data--Minnesota Catholic Conference. Lutheran School data--St. Paul Foundation, *Independent Secondary Schools: The Continuing Challenge* (St. Paul: 1990).

[1]The figure is the mean salary for 1988-89.
[2]Based on 1986-87 average salary multiplied by 1.0856, the change in inflation between 1986-87 and 1988-89.

In 1988-89, the median teacher salary for Minnesota K-12 public schools was $30,769, compared with $22,590 for Catholic high schools and $20,009 for Lutheran high schools.[17] Data from the St. Paul/Minneapolis Archdiocese indicate that the differences would be even larger if elementary schools were included. In the Twin Cities area, the median salary for public schools was $35,635, compared with $23,816 for Catholic high schools and $16,605 for Catholic elementary schools.

Three private, college-prep schools for which we have data pay salaries that are somewhat lower than public school salaries in the same area. In 1988-89, the average median salary for three schools (St. Paul Academy, Blake, and Mounds Park Academy) was $33,289, compared with $35,635 for public schools in the Twin Cities area. Administrators at these three schools believe that they can offer lower salaries and still compete with public schools because enough teachers prefer the working conditions (such as small class sizes) found in private schools.

Another difference between public and private schools in Minnesota involves how resources are divided between teacher salaries and the number of teachers employed. Public-private comparisons of teacher salaries and class sizes indicate that:

- **Private schools tend to place more emphasis on smaller class sizes, whereas public schools tend to place more emphasis on higher teacher salaries.**

To compare student/teacher ratios, we used Minnesota Department of Education data on fall student enrollment and the full-time equivalent of instructional staff, including teachers, principals, counselors, and librarians. Comparing student teacher ratios is complicated by the fact that public schools are responsible for special education in Minnesota. As a result, we present stu-

17 The Lutheran high school average is based on average salary in 1986-87 for four Lutheran high schools. To make the salary comparable to 1988-89 salaries, we adjusted the salaries by the change in the U.S. consumer price index for urban consumers.

dent/teacher ratios for public schools both with and without special education teachers.

Private schools have smaller class sizes, on average, than public schools.

In 1989-90, the student/teacher ratio was 15.3 for private schools, slightly lower than the average for public schools (15.7). If special education teachers were not counted, the student/teacher ratio for public schools would be 18.6. Thus, even though most private schools have much less resources to spend on teachers than public schools, they hire enough teachers to keep class sizes slightly smaller, on average, than public schools.

Some private schools spend more on teachers (in relation to student enrollment) than public schools. While the private, college-prep schools pay salaries close to the public school average, they hire enough teachers to keep class sizes substantially below that of public schools. A recent study found that the student/teacher ratio for five expensive private schools in Minnesota (including two of the three private schools discussed above) was less than ten for the 1986-87 school year. Thus, private schools, whether they have more or less resources to spend on teachers, place greater emphasis on keeping class sizes low rather than raising teacher salaries.

COMPARISON WITH COLLEGES AND UNIVERSITIES

We compared salaries of K-12 teachers with those of college and university faculty in Minnesota. Pay structures for college faculty vary among Minnesota's three major college systems: community colleges, state universities, and the University of Minnesota. Minnesota's community college system uses a pay structure similar to the public K-12 school system. Salaries for community college teachers depend entirely on experience and training. Unlike the public school system, community college salary schedules are uniform across the state.

- In the 1990-91 school year, salary ranges for teachers with a master's degree are $25,750 to $40,390 for community colleges, compared with $24,265 to $38,531 for the average public school district.

Salary ranges in Minnesota's community colleges are slightly higher than the average salary range in Minnesota's public K-12 schools.

The corresponding average maximum salaries for public schools in the Twin Cities metropolitan area is $42,190, slightly higher than community college maximum salaries.

The state university system and the University of Minnesota have more discretion in setting salary levels, particularly the University of Minnesota. For both systems, advancement to higher academic ranks (from assistant to associate or full professor) occurs at the University's discretion and not according to seniority or training. Furthermore, departments of the University of Minnesota negotiate annual salary increases with individual staff members.

Table 2.12 reports average salaries of university faculty in Minnesota. Minnesota's universities are divided into three groups according to the level and diversity of their programs. In 1988-89, Minnesota's K-12 teachers, on

Table 2.12: Average Salaries of University Faculty, 1988-89

Type of University	Rank				
	Professor	Associate Professor	Assistant Professor	Instructor	All Ranks
I Doctoral Institutions (University of Minnesota)	$67,900	$50,900	$44,400	$37,600	$57,600
II-A Comprehensive Institutions (U of M-Duluth, Bemidji, St. Cloud, Mankato, Moorhead)	45,900	37,500	30,500	24,100	N/A
II-B Baccalaureate Institutions (Metropolitan State, Winona, U of M-Morris)	45,400	35,200	29,500	22,800	N/A

Source: Minnesota Higher Education Coordinating Board.

average, had slightly higher salaries than assisstant professors at the two lower university levels -- comprehensive institutions (Mankato, St. Cloud, Moorhead, Bemidji, and University of Minnesota-Duluth) and baccalaureate institutions (Metropolitan State, Winona, and University of Minnesota-Morris). Average K-12 teacher salaries were more than $13,000 lower than assistant professor salaries at the University of Minnesota. Within all three institutional categories, associate professors and full professors had higher salaries than K-12 teachers.

TEACHER SUPPLY AND DEMAND

Chapter 3

A major concern of policy makers is whether, at current compensation levels, schools are able to attract and retain well-qualified staff. To see if this is a problem in Minnesota, we examined the supply and demand for teachers in Minnesota. We asked:

- **What is the demand for teachers per year in Minnesota's public schools? How is this likely to change in the near future?**
- **How does the supply of teachers compare with the demand? How many teachers do Minnesota's colleges produce each year? How many teachers come from other states? How many former teachers return to teaching?**
- **What are the job placement rates for graduates who prepared for teaching at Minnesota's colleges? How do they vary by subject area? How have they changed over time?**
- **How many applications do schools receive for teacher job openings? How does this vary by type of district and subject area?**
- **What do school administrators think about the quality of new teacher applicants?**

To answer these questions, we used a variety of data sources, including teacher licensing data from the Department of Education, teacher placement rates from Minnesota's colleges, and a survey of Minnesota's school districts. In the survey, we asked about teacher recruiting problems by subject area and by type of district. We surveyed personnel administrators or superintendents in all of Minnesota's school districts and had a response rate of about 90 percent.

DEMAND FOR TEACHERS

To measure the demand for new teachers, we used the Department of Education's licensing data for all licensed staff, including teachers, support staff, and administrators. During 1987-88, Minnesota's public schools

employed 50,541 licensed personnel, of which 87 percent were teachers, 6 percent support staff and 7 percent administrators.

During 1988-89, Minnesota's public schools hired 4,316 new licensed staff, including 1,411 who transferred from other public schools in Minnesota. Thus, 2,905 people were hired from outside the schools' workforce of the previous year, an number equal to 5.7 percent of the total licensed staff.

Teacher turnover is low--3.9 percent if teacher transfers are excluded.

The number of new staff hired reflects turnover plus the overall growth in staff positions. Between the 1987-88 and 1988-89 school years, the staff growth rate was 1.8 percent (941 people) and the staff turnover rate was 3.9 percent (excluding teacher transfers between Minnesota districts). Staff turnover includes retirements, which totaled 1.1 percent during 1987-88, about half a percentage point lower than average for the late 1980s.

Future demand for teachers depends on a variety of factors, including student enrollment, teacher turnover, and class size. Some of these factors are influenced by policy decisions or the economy and therefore may be difficult to anticipate. For example, class size is a matter of education policy and financial resources. During the past twenty years, average class size has been declining, largely due to increases in special education staff.

But changes in student enrollment due to the baby boom is the factor that caused the largest swings in teacher demand during the past 30 years. Population projections can accurately predict Minnesota's student enrollment five years into the future. Beyond that, population projections depend on the accuracy of birth rate projections. Student migration also affects student enrollment, but at the state level, its effect has been small compared with changes in birth rates. Another factor that can affect future demand for new teachers is teacher turnover, including retirement, career changes, and teacher migration.

Neither student enrollment nor teacher retirement will likely cause major changes in teacher demand in the near future.

Demographic projections indicate that neither student enrollment nor retirement rates will likely cause major changes in the demand for new teachers in the near future. Population projections by the State Demographer's Office indicate that the number of school-age children will increase by 4 or 5 percent by 1995, remain stable until 2000, and decline between 2000 and 2010. If average class size remains stable during this period, the overall teaching force would increase by about 400 per year during the next five years, after which it would level off and then decline. These growth rates are less than the average growth rate during the late 1980s. Thus, enrollment changes are not likely to substantially change the demand for new teachers.

The age distribution of teachers indicates that teacher retirements will gradually increase in the future but will not reach their peak until about 2010 or after.[1] In 1988-89, teachers were concentrated in the 35-54 age bracket (38.4 percent of teachers were between 35 and 44 years and 29 percent were between 45 and 54 years). Only 12.3 percent were over 54 and only 20.3 percent were under 35. Retirement rates during the late 1980s have fluctuated between one and two percent. This will probably increase to nearly three percent in 10 to 15 years (when teachers currently between 45 and 54 reach retirement age) and to nearly four percent in 20 to 25 years (when teachers between 35 and 44 reach retirement age).

1 Of course, a major change in retirement policy could also affect retirement rates.

SUPPLY OF TEACHERS

Minnesota's public schools hire teachers from several sources, including the reserve pool of former teachers, recent graduates of Minnesota colleges, and teachers from other states (both new and experienced).[2] Overall, we found that:

- **Minnesota has a large and growing surplus of teachers.**

There is a large reserve pool of potential teachers in Minnesota. In August 1989, about 93,000 individuals held valid licenses to teach in Minnesota. In 1988-89, approximately 51,000 worked in Minnesota's public schools, including 45,000 teachers, 3,000 support staff, and 3,000 administrators. There were another 5,000 instructional personnel in Minnesota's private schools, most of whom were licensed, according to data from the St. Paul/Minneapolis Archdiocese. That leaves roughly 38,000 licensed people who did not hold teaching positions in Minnesota's schools. The number in this reserve pool who want to work in Minnesota's public school system is not known. Most teaching licenses are valid for five years and some are valid for a lifetime. In 1988-89, Minnesota's public schools hired about 800 teachers from the reserve pool, about 28 percent of the new teachers hired.

Over 2,000 individuals from other states apply for Minnesota teacher licenses per year. Reasons cited by personnel officials we interviewed include that Minnesota's teachers are well paid and have good working conditions. In 1988-89, Minnesota schools hired about 436 experienced teachers and 253 new teachers from other states.

Teachers are hired from a reserve pool of former teachers, from other states, or directly from colleges.

In 1988-89, about 3,550 students eligible to teach graduated from Minnesota's colleges. As Table 3.1 shows:

- **Only one-fourth of "teacher" graduates from Minnesota's colleges found full-time teaching jobs in Minnesota schools for the following school year.**

Another 15 percent obtained full-time teaching positions in other states and 16 percent found part-time positions (in-state or out-of-state). Many, if not most, of the graduates from these two categories would have preferred a full-time position in Minnesota. In addition, 22 percent of the graduates were unemployed or under-employed (e.g. those who were a substitute teacher, coach, or teacher aid, but not by choice) and is still seeking a regular teaching position. Twelve percent found employment in another field.

Furthermore, the number of new college graduates has been growing and the percent finding teaching jobs has been declining. Table 3.2 reports that in 1988-89, 3,550 students eligible to teach graduated from Minnesota colleges, up from 2,582 in 1984-85. The percentage who obtained full-time teaching jobs the year after graduation has declined from 60 percent in 1978-79 to 48.5 percent in 1984-85 to 39.5 percent in 1988-89.

2 This discussion draws upon a report by Roger Delgehausen, *Teacher Supply and Demand: A Report to the Governor's Task Force on Human Resource Policies for Elementary and Secondary Education*, (St. Paul: Minnesota Department of Education, February 2, 1990).

Table 3.1: Placement Rates for Teachers Prepared by Minnesota Colleges, 1988-89

	Number	Percent
Total teachers prepared	3,550	--
Teachers in sample	3,361	100.0%
Teaching full-time	1,329	39.5
in Minnesota	810	24.1
out-of-state	495	14.7
location not known	24	0.7
Teaching part-time	552	16.,4
Employed in other field	425	12.6
Continuing education	187	5.6
Seeking teacher position	796	23.7
Other	72	2.1

Source: Minnesota College and University Placement Association.

Table 3.2: Trend in Teacher Production and Placement, Minnesota Colleges, 1985 through 1989

The number of "teacher" graduates is increasing; the percent who find full-time teaching positions is declining.

Year	Number of Teachers Prepared	Percent Placed in Full-Time Teaching Positions
1979	3,360	60.0%
1985	2,582	48.5
1986	2,707	46.0
1987	3,037	45.3
1988	3,465	42.2
1989	3,550	39.5

Source: Minnesota College and University Placement Association.

In summary, there is a large surplus of teachers in Minnesota. However, there may still be shortages in particular teaching specialties or in certain types of school districts. We examine this question in the following sections.

Supply and Demand for Teachers by Subject Area

We looked at the relationship between supply and demand for different types of teachers in three ways: (1) teacher placement rates for college graduates, (2) number of applications received by school districts per job opening, and (3) the subjects for which, in the opinion of school administrators, schools have difficulty recruiting well-qualified staff.

"Teacher" graduates in special education were the most likely to find full-time teaching jobs.

Placement Rates

Placement rates, reported in Table 3.3, indicate that in all fields except special education, less than one-third of the 1988-89 graduates found full-time teaching positions in Minnesota (the corresponding rate for special education was 40 percent).

Nationally, concerns about teacher shortages often focus on mathematics and science teachers. However, Minnesota graduates specializing in mathematics or science teaching were slightly less successful than average at obtaining teacher jobs. Only 17 percent of mathematics graduates and 22 percent of science graduates became full-time teachers in Minnesota. While these graduates were somewhat more likey to find non-teaching jobs, 23 percent of mathematics graduates and 22 percent of science graduates were still seeking teaching positions (compared with 24 percent for all "teacher" graduates).

Table 3.3: Placement of "Teacher" Graduates from Minnesota Colleges, 1988-89

Teaching Field	Number of Graduates	Teaching Full-Time[1]			Teaching Part Time[2]	Seeking Teaching Position[3]	Employed but not Teaching
		Total	In Minnesota	Out of State			
Special Education	137	59%	40%	18%	6%	21%	9%
Foreign Languages	80	46	29	14	22	16	10
Music	102	45	30	14	17	16	10
English/Language Arts	203	45	21	21	17	19	10
Elementary/Pre-school	1846	43	28	15	18	25	9
Home Economics/Industrial Arts	57	41	16	25	4	27	21
Science	189	35	22	12	17	22	16
Mathematics	218	35	17	18	11	23	19
Art	57	33	15	18	22	20	22
Other	101	31	21	9	7	9	23
Social Studies	247	29	13	16	17	31	17
Business	89	27	12	13	12	25	29
Physical Education/Health	224	23	17	6	20	27	17
Secondary Total	1567	34	19	14	16	23	17
Elementary Total	1846	43	28	15	18	25	9
Special Education Total	137	59	40	18	6	21	9
Grand Total	3550	40	24	15	16	24	13

Note: Full-time in-state and out-of-state percentages do not usually equal full-time total percentages because of missing geographic data on some responses.

Source: Minnesota College and University Placement Association.

[1]Full-time teaching includes long-term teacher substitute positions.
[2]Part-time teaching includes regular part-time teaching positions and those who, by choice, are substitute teachers, teacher aides, or athletic coaches.
[3]Seeking teaching position includes those who are unemployed and seeking employment and those who are employed and are seeking a teaching position (includes substitute teachers, teacher aides, and coaches who prefer a regular teaching position).

Application Rates

Elementary teacher positions had the highest application rate; special education, support staff, and foreign language positions had the lowest rates.

Table 3.4 reports the statewide average number of applications per job opening for different types of positions, based on our survey of Minnesota school districts.[3] The number of applications per job opening ranged from 73 for general elementary positions to eight for special education for the emotionally and behaviorally disturbed (EBD). Social studies and physical education also had high application rates. English and mathematics were slightly above average and science was slightly below average. Foreign language, special education, and support staff positions had relatively few applications per opening (14 or less).

Table 3.4: Number of Applications per Job Opening by Subject, 1990

Subject	Job Openings	Applications Per Opening
Elementary	918	73
Social Studies	106	70
Physical Education	98	62
English	155	46
Mathematics	115	45
Science	123	39
Art	54	29
Music	147	23
Home Economics/Industrial Arts	56	23
Combinations	40	20
Special Education (excluding EBD)	359	14
Library/Media	38	13
Foreign Language	103	13
Counselor/Social Worker/Psychologist	97	13
Special Education for the Emotionally or Behaviorally Disturbed (EBD)	101	8

Source: Office of Legislative Auditor's survey of Minnesota school districts.

Teacher Recruitment Problems

Teacher recruitment problems reported by districts in our survey are consistent with the application rate data, as can be seen in Table 3.5. No district had any difficulty recruiting well-qualified staff for elementary, social studies, and physical education positions. These three subjects had the three highest application rates. Other subjects with low recruiting problem rates were English (1 percent), mathematics (5 percent), and art (5 percent).

Positions with which schools had the the most problems were specialized positions. Forty-three percent of the districts with EBD job openings had difficulty finding a suitable teacher. Other common problem areas were counselors and psychologists (27 percent), other special education (26 percent), and

3 Job openings are reported in full-time equivalents (FTE). If a district had a part-time job opening but no full-time openings, it was counted as one opening in the average application rate calculation.

foreign language (23 percent). Again, this is consistent with the application data, as each of these specializations had lower application rates than other positions.

Table 3.5: Teacher Recruiting Problems by Subject Area, 1990

Subject Area	Number of Districts with Job Opening	Percent who had Difficulty Recruiting Well-Qualified Staff
Special Education for the Emotionally or Behaviorally Disturbed (EBD)	54	43%
Counselor/Psychologist	67	27
Special Education (non-EBD)	131	26
Foreign Languages	69	23
Science	87	17
Teaching Combinations	33	15
Miscellaneous Other	104	15
Home Economics/Industrial Arts	49	10
Media/Library Specialist	34	9
Music	98	9
Mathematics	76	5
Art	43	5
English	104	1
Elementary Education	215	0
Social Studies	65	0
Physical Education	53	0

Source: Office of Legislative Auditor's survey of Minnesota school districts.

No district had difficulty recruiting well-qualified staff for elementary, social studies, or physical education positions.

Supply and Demand for Teachers by Type of District

To find out how recruitment problems varied across the state, we compared application rates for different types of school districts. As Table 3.6 shows, application rates for specialized positions tend to be lower in small outstate schools. School districts with fewer than 700 students received, on average, less than five applications per job opening for EBD and support staff positions (counselors, psychologists, and social workers). School districts in the Twin Cities metropolitan area received an average of 12 and 15 applications for EBD and support staff positions respectively.

Districts with fewer than 700 students also tended to receive fewer applications for teacher jobs in foreign language, music, and science. In contrast, smaller districts received more applications than larger districts for teacher jobs in elementary, social studies, and physical education. For these fields, application rates were high for all types of districts.

Table 3.6: Number of Applications per Job Opening by Subject and Type of District, 1990

	Outstate School Districts (by student enrollment)					Twin Cities Metro School Districts
Subject Area	0-350	350-700	700-1500	1500-3000	3000 +	All Metro Districts
Elementary Education	100	105	105	83	60	55
Social Studies	105	62	117	107	54	52
Physical Education	83	155	114	61	43	47
English	22	56	62	52	47	36
Mathematics	32	23	83	53	64	33
Science	19	27	48	43	44	40
Art	--	7	15	32	65	24
Music	11	17	30	23	26	25
Special Education (excluding EBD)	19	8	15	15	14	14
Foreign Language	9	3	11	10	12	15
Counselor/Social Worker/Psychologist	4	5	12	11	10	15
Special Education for the Emotionally or Behaviorally Disturbed (EBD)	3	4	6	8	5	12

Source: Office of Legislative Auditor's survey of Minnesota school districts.

Teacher Applicant Quality and Teacher Pay

Our survey asked school administrators how satisfied they were with the quality of teacher applicants. Overall, satisfaction levels were high. Fifty-one percent were very satisfied, 44 percent were satisfied, and 5 percent were not satisfied with teacher applicants, and 2 percent were satisfied with applicants for some positions but were dissatisfied with others. As Tables 3.7 and 3.8 show, satisfaction levels were somewhat higher in the Twin Cities metropolitan area and larger outstate districts. But, a large majority of schools in all size categories were satisfied with the quality of teacher applicants. Among districts in the smallest size category, eight percent were not satisfied with teacher applicants and five percent gave qualified satisfied/ not satisfied answers (they were dissatisfied with applicants for certain positions, satisfied with others).

We also asked school administrators whether "teacher pay is currently high enough to attract a sufficient number of well-qualified teachers?" Overall, 56 percent said teacher pay was high enough, 25 percent said it was not high enough, and 19 percent gave a qualified opinion. Most of the qualified answers claimed that teacher pay was high enough for some fields but not for other fields. Reasons frequently given for negative answers were (1) pay was too low to compete with private industry for the best students, (2) pay is high enough for some fields, but too low for others, (3) pay is too low to attract enough teachers to rural Minnesota, (4) pay is too low to compete with neighboring districts, and (5) entry level salaries were not competitive with other jobs.

Table 3.7: School Administrators' Satisfaction with Quality of Teacher Applicants by Type of District, 1990

Type of District	Number of Districts Responding	Very Satisfied	Satisfied	Not Satisfied	Dissatisfied/ Satisfied[1]
State Total	354	51%	44%	3%	2%
Twin City Metro Districts	39	62	38	0	0
Outstate Districts (by enrollment)					
over 3000	20	85	10	0	5
1500-3000	41	59	39	2	0
700-1500	101	55	40	4	1
350-700	88	32	65	2	1
0-350	65	48	40	8	5

Source: Office of Legislative Auditor's survey of Minnesota school districts.

[1]School administrators who commented that they were satisfied with applicants for some positions but were dissatisfied with others.

Satisfaction with the quality of teacher applicants was highest in the Twin Cities area and in large out-state districts.

Table 3.8: School Administrators' Satisfaction with Quality of Teacher Applicants by Region, 1990

Region	Number of Districts Responding	Very Satisfied	Satisfied	Not Satisfied	Dissatisfied/ Satisfied[1]
State Total	354	51%	44%	3%	2%
Southwest	81	46	48	5	1
Northwest	103	49	45	5	2
Central	58	52	45	2	2
Southeast	42	52	40	2	5
Northeast	31	55	42	3	0
Twin City Metro	39	62	38	0	0

Source: Office of Legislative Auditor's survey of Minnesota school districts.

[1]School administrators who commented that they were satisfied with applicants for some positions but were dissatisfied with others.

Tables 3.9 and 3.10 report how teacher pay opinions vary by region and district size. There is some regional variation, but in all categories shown, teacher pay is considered high enough more often than it is not. In southwestern Minnesota, 43 percent of administrators think that salaries are high enough, compared with 53 to 64 percent in the other regions. Administrators in southeast

and northeast Minnesota are the most likely to think that teacher pay is high enough.

Table 3.9: View of School Administrators on Whether Teacher Pay is High Enough to Attract Enough Well-Qualified Teachers by Region, 1990

Region	Number of Districts Responding	Salaries are High Enough	Salaries are not High Enough	Qualified Opinion
State Total	354	56%	25%	19%
Southwest	81	43	33	24
Northwest	103	59	28	13
Central	58	53	24	23
Southeast	42	64	12	24
Northeast	31	64	16	20
Twin City Metro	39	59	20	21

Source: Office of Legislative Auditor's survey of Minnesota school districts.

Table 3.10: View of School Administrators on Whether Teacher Pay is High Enough to Attract Enough Well-Qualified Teachers by Type of District, 1990

Type of District	Number of Districts Responding	Salaries are High Enough	Salaries are not High Enough	Qualified Opinion
State Total	354	56%	25%	19%
Twin City Metro Districts	39	59	20	21
Outstate Districts (by enrollment)				
over 3000	20	65	5	30
1500-3000	40	62	12	26
700-1500	101	58	20	22
350-700	88	47	35	18
0-350	66	54	36	10

Source: Office of Legislative Auditor's survey of Minnesota school districts.

These regional patterns generally correspond to the variation in average salaries reported in Chapter 1. School districts in southwest Minnesota had an average salary of $27,069, the lowest among six regions. The highest outstate regional averages were $30,931 in northeast Minnesota and $30,172 in southeast Minnesota.

CONCLUSIONS

Teacher pay is competitive with pay in most other professions.

A central issue we address in this report is the competitiveness of teacher compensation compared with that of alternative occupations. Pay comparisons presented in Chapter 2 indicate that teacher pay is competitive with pay in most other professional and managerial occupations. On average, teacher compensation, after adjusting for days and hours worked, is higher than compensation of college graduates and employees in professional and managerial occupations.

Since prospective teachers consider pay and a variety of other factors when choosing a career, we also examined the supply and demand for teachers in Minnesota. Various measures of teacher supply and demand indicate that teaching is competitive with most other occupations. Placement data from Minnesota's colleges show that only one-fourth of "teacher" graduates find full-time teaching jobs in Minnesota. Minnesota's schools receive an average of 44 applications per job opening.

A surplus of teachers does not necessarily mean that there are enough well-qualified teachers. But when we asked school administrators in our survey whether they had problems recruiting well-qualified staff, few reported difficulty finding well-qualified applicants for most types of teacher positions. Furthermore, only three percent of school administrators said that they were dissatisfied with the overall quality of teacher applicants.

Although teacher pay compares favorably with the pay of the average college graduate, several occupations offer better pay than teaching. Professional occupations with higher pay than teachers tend to require more extensive training (such as law and medicine) or be in technical fields (such as engineering and systems analysis). As a result, one might expect that schools would have difficulty recruiting teachers in mathematics and science. We found that 17 percent of districts with job openings in science reported a recruiting problem, an amount which is above average but still quite low. The corresponding figure for mathematics was only five percent.

Application rates and recruiting problems varied widely among different subject areas. Teaching positions in specialized fields tend to have relatively high rates of recruiting problems and low application rates. This is true of positions in special education (particularly for the emotionally and behaviorally disturbed), support staff (counselors, social workers), and foreign language.

One way to attract more people to positions with shortages is to increase teacher pay. The research literature discussed in Chapter 1 indicates that higher teacher pay significantly increases the supply of teachers. However, under the current pay structure, it would not be possible to target pay increases to specific problem areas because there are no pay differentials based on subject area. Increasing teacher salaries overall in order to solve problems in a few subject areas would cost more than a targeted pay increase and would leave less resources to meet other educational needs.

Furthermore, research evidence does not establish that higher teacher pay improves student achievement. If teacher salaries were an important tool for im-

proving student achievement, one would expect to see stronger evidence than currently exists.

The findings in this report have diverse policy implications at both the local and state level. Under Minnesota's education system, the state does not directly control the level or the structure of teacher pay. However, the state influences teacher pay in several ways, including state aid, right-to-strike laws, and procedures governing teacher license waivers.

Teacher pay is a state concern because it affects the use of state resources by schools and because the state has an interest in the quality of education. Teacher pay decisions in local school districts affect not only the supply of teachers, but the amount of resources available to finance other educational needs.

SELECTED PROGRAM EVALUATIONS

Board of Electricity, January 1980	80-01
Twin Cities Metropolitan Transit Commission, February 1980	80-02
Information Services Bureau, February 1980	80-03
Department of Economic Security, February 1980	80-04
Statewide Bicycle Registration Program, November 1980	80-05
State Arts Board: Individual Artists Grants Program, November 1980	80-06
Department of Human Rights, January 1981	81-01
Hospital Regulation, February 1981	81-02
Department of Public Welfare's Regulation of Residential Facilities for the Mentally Ill, February 1981	81-03
State Designer Selection Board, February 1981	81-04
Corporate Income Tax Processing, March 1981	81-05
Computer Support for Tax Processing, April 1981	81-06
State-sponsored Chemical Dependency Programs: Follow-up Study, April 1981	81-07
Construction Cost Overrun at the Minnesota Correctional Facility - Oak Park Heights, April 1981	81-08
Individual Income Tax Processing and Auditing, July 1981	81-09
State Office Space Management and Leasing, November 1981	81-10
Procurement Set-Asides, February 1982	82-01
State Timber Sales, February 1982	82-02
Department of Education Information System, March 1982	82-03
State Purchasing, April 1982	82-04
Fire Safety in Residential Facilities for Disabled Persons, June 1982	82-05
State Mineral Leasing, June 1982	82-06
Direct Property Tax Relief Programs, February 1983	83-01
Post-Secondary Vocational Education at Minnesota's Area Vocational-Technical Institutes, February 1983	83-02
Community Residential Programs for Mentally Retarded Persons, February 1983	83-03
State Land Acquisition and Disposal, March 1983	83-04
The State Land Exchange Program, July 1983	83-05
Department of Human Rights: Follow-up Study, August 1983	83-06
Minnesota Braille and Sight-Saving School and Minnesota School for the Deaf, January 1984	84-01
The Administration of Minnesota's Medical Assistance Program, March 1984	84-02
Special Education, February 1984	84-03
Sheltered Employment Programs, February 1984	84-04
State Human Service Block Grants, June 1984	84-05
Energy Assistance and Weatherization, January 1985	85-01
Highway Maintenance, January 1985	85-02
Metropolitan Council, January 1985	85-03
Economic Development, March 1985	85-04
Post Secondary Vocational Education: Follow-Up Study, March 1985	85-05
County State Aid Highway System, April 1985	85-06
Procurement Set-Asides: Follow-Up Study, April 1985	85-07

Insurance Regulation, January 1986	86-01
Tax Increment Financing, January 1986	86-02
Fish Management, February 1986	86-03
Deinstitutionalization of Mentally Ill People, February 1986	86-04
Deinstitutionalization of Mentally Retarded People, February 1986	86-05
Management of Public Employee Pension Funds, May 1986	86-06
Aid to Families with Dependent Children, January 1987	87-01
Water Quality Monitoring, February 1987	87-02
Financing County Human Services, February 1987	87-03
Employment and Training Programs, March 1987	87-04
County State Aid Highway System: Follow-Up, July 1987	87-05
Minnesota State High School League, December 1987	87-06
Metropolitan Transit Planning, January 1988	88-01
Farm Interest Buydown Program, January 1988	88-02
Workers' Compensation, February 1988	88-03
Health Plan Regulation, February 1988	88-04
Trends in Education Expenditures, March 1988	88-05
Remodeling of University of Minnesota President's House and Office, March 1988	88-06
University of Minnesota Physical Plant, August 1988	88-07
Medicaid: Prepayment and Postpayment Review - Follow-Up, August 1988	88-08
High School Education, December 1988	88-09
High School Education: Report Summary, December 1988	88-10
Statewide Cost of Living Differences, January 1989	89-01
Access to Medicaid Services, February 1989	89-02
Use of Public Assistance Programs by AFDC Recipients, February 1989	89-03
Minnesota Housing Finance Agency, March 1989	89-04
Community Residences for Adults with Mental Illness, December 1989	89-05
Lawful Gambling, January 1990	90-01
Local Government Lobbying, February 1990	90-02
School District Spending, February 1990	90-03
Local Government Spending, March 1990	90-04
Administration of Reimbursement to Community Facilities for the Mentally Retarded, December 1990	90-05
Pollution Control Agency, January 1991	91-01
Nursing Homes: A Financial Review, January 1991	91-02
Teacher Compensation, January 1991	91-03
State Investment Performance, forthcoming	
Corrections Policy, forthcoming	
Game and Fish Fund, forthcoming	
Greater Minnesota Corporation: Organizational Structure and Accountability, forthcoming	
State Contracting, forthcoming	

Evaluation reports can be obtained free of charge from the Program Evaluation Division, 122 Veterans Service Building, Saint Paul, Minnesota 55155, 612/296-4708.

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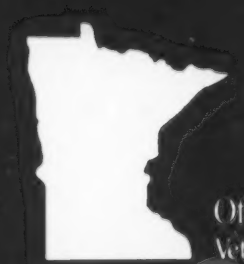

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